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An Address

SOME THOUGHTS—NEW AND OLD—ON ARTERIOSCLEROSIS*

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THERE are certain rather clear-cut ideas about arteriosclerosis which are widely accepted by the medical profession. Such are; that thickening of the arteries, with coincident rise in blood pressure, is a sign of old age; that arterial degeneration is one of the principal concomitants or sequelae of nephritis, diabetes, gout, alcoholism, and lead-poisoning, of syphilis and hard work; that diseased arteries cause elevation of blood pressure, and, *vice versa*, that high blood pressure induces vascular degeneration.

It will doubtless, then, come with a distinct shock of surprise when I make the statement that there is hardly one of the above propositions, received with so ready a faith, that has been established to the point of demonstration, or that has not been subjected to very destructive criticism. In every instance there are about as many opponents as supporters. I refer, of course, to the researchers in this particular field. We ought to except syphilis, for whatever the resemblances, in regard to the end-results between syphilitic arteritis and ordinary arteriosclerosis, these affections are undoubtedly distinct processes. They differ in their etiology, they differ in their pathogenesis; the former is an infection of a vessel wall, the latter is a degeneration.

In order to clarify the issues involved, I will discard all those disorders of the arterial system that are frankly due to specific infections and other forms of inflammation, and confine my remarks to arteriosclerosis proper, viz., that form of arterial degeneration which comes on insidiously, is the product of years, and of which the causes are as yet only imperfectly apprehended. Arteriosclerosis is worthy of our respectful attention, whether we consider its ubiquity, or the importance of its manifestations. I need only mention such conditions as, cerebral haemorrhage, angina pectoris, aneurysm, one form of chronic nephritis, and gangrene of the lower extremities. It makes its appeal to the surgeon as well as the physician. If any one disease deserves the adjective "universal," arteriosclerosis is that disease.

I will not bore you with any detailed description of the finer structure of the aorta and smaller vessels. Suffice it to say, that the aorta has a very large proportion of elastic tissue in its make-up, arranged so as to give a maximum of strength and resilience. This ensures that, instead of a series of jets of blood corresponding to, and synchronous with, the beats of the heart, there is a steady even flow. The smaller vessels contain less elastic material, and the arterioles are chiefly made up of muscle. Thus, the calibre of these vessels is much more under the control of the vaso-regulative nervous system. We should add that the structure of corresponding vessels, taken from different individuals, is not always identical, even at the same point. This lends colour to the view that such variations may be in-

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herited, and therefore, a constitutional peculiarity of a given individual. This was the teaching of the late Sir Wm. Osler.

Three anatomical forms of arteriosclerosis are usually recognized:—(1) The nodose; (2) Mönckeberg's sclerosis; and (3) Endarteritis obliterans.

In the first variety, the earliest changes are seen in the formation of slightly elevated, smooth, flat, spots and streaks, running longitudinally, often most abundant on the posterior aspect of the vessel and around the openings of the lateral branches, though not necessarily confined to these regions. In the more advanced stages, similar plaques are to be found associated with the older lesions. These patches are due to a fibroid thickening of the intima and the presence of wandering cells. Both the connective tissue and wandering cells are laden with fat. This fat deposit is by no means confined to the deeper layers of the plaque, but extends to the surface. In the later stages, the thickened intima becomes still thicker, being composed of dense homogenous, almost hyaline, connective-tissue, with necrosis of the deeper portions. The vasa vasorum rarely advance from the media into the granulating area, but it is said that injected material shows an increased vascular supply in the affected parts. This is of some importance in connection with one of the theories of causation. When the larger spots are cut into, they are found to contain yellow, opaque, pultaceous matter, not unlike porridge, whence the term "atheroma." This material is formed of débris, fat, fatty acids, calcium salts, and cholesterin. In the most advanced form of the disease, the plaques are large, hard, brittle, and the covering endothelium may have been shed, converting them into shallow ulcers, to which blood clot may be adhering.

The second type of arteriosclerosis, common in the peripheral arteries, particularly of the extremities, is known as Mönckeberg's sclerosis, in which the changes are principally in the media, the calcified material being laid down in rings. This gives the affected vessel somewhat the appearance of a fowl's trachea. In places the lumen may be reduced to a mere trace, though such areas are usually sporadic. The affection, on the whole, does not tend to obliteration of the vessels, though this result may happen. Mönckeberg would separate this form from true arteriosclerosis, on the ground that the changes in the media are more extreme than those in the intima. It is true, also that the existence of this form of sclerosis in the peripheral vessels does not connote involvement of the larger, more internal, arteries. Nevertheless, it is often combined with extensive intimal thickening, such as characterizes ordinary arteriosclerosis, so that it is not quite clear that the two forms are entirely different.

Endarteritis obliterans, improperly so-called, as it is not primarily an inflammation, the third form mentioned, is characterized by the fact that considerable extents of the vessel walls are relatively enormously thickened, with the result that the lumen is much diminished, and, indeed, may be occluded. The smaller arteries and arterioles are the ones involved in this process. The well-known "pipe-stem" radial may be taken as the type. I have seen the same condition affecting the small arterioles of the pia-arachoid, so that the brain appeared to be enveloped in a mesh-work of coarse white threads.

Why these varied types of sclerosis is hard to say. Possibly, variations in the anatomical structure of vessels of the different orders, the slower circulation in the smaller vessels, thus permitting the more continued action of toxins; and functional states in those regions where the vascular lesions are more marked should be considered.

The etiology of arteriosclerosis is even yet but imperfectly understood. Many theories have been advanced, some based on clinical observation, some on experiment, and some purely speculative. None seems entirely adequate. The difficulty is that the disease begins insidiously and extends over years. So many intercurrent conditions come into operation in the course of even a comparatively short life that the original question becomes more or less hidden and confused. What factors should come into the etiology, and what weight should be attached to them, become a matter of opinion. Experiment, while it has thrown much light upon the matter, has to be interpreted with some caution, for the reason that attempts are made by artificial means extending over a few weeks or at most months, to

reproduce lesions that ordinarily require years for their full development.

There are very good grounds for dividing the cases of arteriosclerosis into three main groups: (1) The senile or decresent; (2) The toxic, and (3) The hyperpietic. At any rate, this classification affords us a convenient and useful scheme for discussion.

There is a trite saying that "A man is as old as his arteries." Or, expressing it otherwise, the arteries are the first and prime expression of oncoming years, as evidenced by retrogressive changes. This manifestation of senility may be precocious or delayed. A highly advanced form of arteriosclerosis has been found in young persons, and some degree of the affection has been seen even in children. This introduces the further idea that deficiency in "vital rubber" may be inherited. Certainly arterial disease has been known to run in families. A well-known instance is that of the Arnold family. Dr. Thomas Arnold, of Rugby fame, died of angina pectoris. His son Matthew Arnold died of angina pectoris, and his son, Sir Edwin, died of angina pectoris. Hereditary influences have been emphasized by Sir Wm. Osler, Romberg, Fraenkel, Kisch and Hirsch, but have been disregarded by Thoma, Edgren, v. Schrötter and others. My former colleague, Klotz, now of Toronto, found calcareous deposits in the aortas of persons as young as thirty-five, who had died of diseases other than vascular. He concluded that vascular degenerative changes occurred early in life, and might be regarded as a physiological phenomenon. Whether such changes should be brought into the domain of the pathological is open to debate. Certainly, sclerotic changes in the vessels do not always steadily increase with years. And, we have all met with persons who have hardened arteries, and even high blood pressure, and yet have attained much beyond the traditional "three score years and ten." Old age is not then the essential factor. Klotz's observations show that here the essential lesion consists in fatty degeneration and eventual calcification of the muscle fibres in the middle zone of the media, with finally similar involvement of the elastic fibrils. This would seem to separate this apparently physiological form of arterial degeneration from the nodose, atheromatous type, and link it up with the Mönckeberg variety.

The rôle of hard muscular work in the production of arteriosclerosis is difficult to appraise. Those performing the heaviest grades of manual labour are often exposed to the action of deleterious fumes, to bad ventilation, to bad housing, and may be addicted to the excessive use of alcohol and tobacco; may, also, be the subjects of syphilis. Occupations which conduce to elevation of the blood pressure, doubtless also predispose to arteriosclerosis. Marchand cites the case of a young person, who stood on one foot, the other being paralyzed. There was a marked sclerosis of the vessels in the overworked limb.

The French workers, notably Huchard, lay much stress upon the influence of infectious processes in inducing arteriosclerosis. Typhoid fever, rheumatism, scarlatina, diphtheria, and influenza, are frequently followed by sclerotic patches in the aorta. These opinions are supported by clinical findings, and by the results of experimental work. Chronic infections of the rheumatic type, and the toxins of staphylococcus seem to play the most important part. The exact bearing of these findings requires still more work before being accepted in their entirety. Other toxic substances, such as lead, barium, nicotine, and alcohol, have been tried out experimentally, and positive results have been reported, but have not received wide acceptance. Adler in his work used relatively enormous amounts of nicotine in dogs, but his results do not prove that smoking is effective in the direction of producing arterial degeneration. Many have believed in the importance of alcohol in the same connection, notably Edgren, Hirsch, Schroetter, Chiari, and Klemperer, but Romberg, and especially Cabot, could not find any special relationship between alcoholism and this disease.

There is a widespread belief in the close association of arteriosclerosis and vascular hypertension. The condition of heightened blood pressure has been termed by Sir Clifford Allbutt, hyperpiesis, and he draws a clear distinction, and apparently rightly, between the arteriosclerosis associated with hyperpiesis and the senile form, which may not be associated with increased tension, or with that striking concomitant of it—hypertrophy of the heart.

There are three possible ways by which the blood pressure may be raised:—(1) By an over-acting heart; (2) By increased peripheral resistance; and (3) By overfilling of the cardio-vascular system. It is not at all probable that the first factor has any weight. The vessels are so distensible, and the potential vascular capacity is so great, to wit, in the splanchnic area, that it is hard to believe that even an excessive action of the heart could bring about more than a fleeting elevation of intravascular pressure. Increased peripheral resistance may be due to thickening of the terminal arterioles and capillaries (arterio-capillary fibrosis of Gull and Sutton) but this condition would have to be very widespread, and I am not sure that there is much anatomical evidence in favour of this idea. Certainly, it is not common. Of much more importance is the increased circulatory obstruction due to vasoconstriction resulting from excessive action of the sympathetic nervous system. The great variations in the degree of blood pressure which may occur even in the short space of half an hour, sometimes amounting to forty or fifty millimetres of mercury, argue strongly for an important rôle on the part of the nervous system. Here, too, should be mentioned the well-known action of adrenin in raising blood pressure, which appears to be identical with that of the sympathetic system. It has been shown that under the influence of strong emotion, such as fright, an "adrenin crisis" occurs, and it is not unfair to assume that worry, fright, anger, over-reaction to outside influences, such as for example, characterizes the active, dominating, perhaps neurasthenic personality, influences the output of this particular internal secretion, with a corresponding effect upon the vessels and the blood pressure.

The harmful effect of habitual over-filling of the blood vessels, the state of habitual plethora, is seen in those who daily consume large quantities of beer, the brewery drayman, for example. Probably, the large quantities of tea, or even water, that some indulge in, should not be regarded as innocuous.

Attempts have been made to reproduce the lesions of arteriosclerosis experimentally by raising the blood pressure by simple mechanical means (Klotz:—posturing; Harvey:—clamping the aorta). Adrenin injections have also been resorted to, and these produce a form of sclerosis similar to the Mönckeberg type. In this case, however, the effect seems rather to be a toxic one and not a result of increased intravascular tension, for if substances like amyl nitrite be exhibited at the same time, to counteract the pressor action of the adrenin, the lesions are still produced. Experiments directed towards increasing tension have not always proved successful in inducing arteriosclerosis, and it has been objected, farther, that these experiments have generally been essayed on the rabbit, an animal that is notoriously subject naturally to arterial degeneration. And, the occurrence of arteriosclerosis in the very young would seem to indicate that there is more than increased blood pressure or "wear and tear" involved in the process. However, giving due weight to the various objections that have been brought against these experiments, it appears to me to be proved sufficiently that increased intravascular pressure alone is competent to produce degenerative lesions in the vessels with concomitant hypertrophy of the heart. It must be confessed that the value of this conclusion is somewhat discounted by the fact that the changes produced experimentally are more akin to the senile form of arteriosclerosis than to atheroma proper. We must, therefore, be ready to admit that in the latter case there must be other causative factors besides hypertension.

I referred just now to the importance of the sympathetic nervous system in raising blood pressure. This effect may be brought about by stimulation of the vaso-constrictor fibres, together with increased heart-action. But there is another possible factor that enters here. Langdon Brown has shown that sympathetic stimulation produces stasis in the bowel, thus conducing to increased putrefactive changes therein. This, and the discovery of Barger and Dale of diamines derived from the putrefactive decomposition of proteins, which have a pressor effect, go far to show how constipation and dietetic factors may play an inportant rôle in the causation of arteriosclerosis.

Some suggestive and, probably, far-reaching results have been obtained by feeding experimental animals with various substances, either food-stuffs or compounds closely related to them. Thus proteins of animal origin have been intro-

duced into the dietary of the ordinarily vegetarian rabbit. In this animal, milk feeding will produce changes in the aorta accompanied by the deposition of fat, which bacteria alone cannot do. In this connection the work of Anitschkow is of special importance. He fed animals with cholesterol dissolved in sunflower seed oil, and produced a condition in the aorta, characterized by hyperplasia of the intima with deposition of fat, differing from the changes produced by adrenin, but closely resembling the lesions of human arteriosclerosis. According to this worker, increased intravascular tension fails to induce the characteristic changes, though these appear if cholesterol feeding be superadded. Moreover, it is worthy of note, that when the blood pressure is artificially heightened, less cholesterol is required to produce the same results. These experiments, too, acquire a greater importance in view of certain other considerations. Cholesterol is a simple unsaturated monatomic alcohol, having the nature of a complex terpene, and its importance in the animal economy is evidenced by its widespread distribution. It is found in all tissues. Dried corpus callosum, for example, contains as much as 15%. There is about 5% in the liver. Cholesterol, also, is closely related to fats, lecithin, and lipoidal substances generally. It may combine with fatty acids to form fat, and has some powers of linkage with proteins. Cholesterol in the blood is increased by a diet rich in lipoids, such as meat, milk, butter and eggs. One of the properties of cholesterol is that it is antihaemolytic. It may, therefore, tend to plethora and increased density of the blood. Pathologically, we find cholesterol increased in cases of diabetes, nephritis, arteriosclerosis, and in pregnancy. It is easy to see, then, that conditions which bring about increased amounts of this substance in the blood, especially if associated with heightened blood pressure, may be important factors in the causation of arteriosclerosis.

Probably, therefore, we shall have to accept a combination theory to explain arteriosclerosis. First, we have the action of certain toxic substances upon the vessel walls, whether these toxins be bacterial or putrefactive in nature or a toxic action of an excess of adrenin. Secondly, dietetic errors, in the direction of too great an absorption of cholesterol and lipoidal substances, are of great importance. Thirdly, increased blood pressure, whether inherent, that is due to defective "vital rubber," or acquired from various directions, plays its part, perhaps, not so much by its direct action, as by aggravating, or at least assisting, the factors abovementioned. In this connection it is well to remember that blood pressure, from the pathological standpoint, is a relative matter. What is a normal blood pressure for one individual, as indicated by the sphygmomanometer, will be too high for the person who has inherited a structural weakness of his arteries. Here, then, the family history is of importance.

The conclusion of the whole matter may, in my judgment at least, and for the present, be summed up something like this: —

We should carefully distinguish between the vascular changes incident to advancing years and true arteriosclerosis. It is doubtful whether we can do much to influence the course of the former, which is really a physiological process. But should such a physiological sclerosis be premature, that is, excessive for the age-period of the person concerned, it becomes pathological, and calls for intervention. A bad family history in this direction should be a danger signal.

Hard work, whether of mind or body, probably never harmed anybody, provided that the general conditions of life be satisfactory. But, the emotional, effervescent person, and "the driver," especially if given to worry, are in special danger. To advise against worry is, doubtless, a counsel of perfection, but "the simple life" can, at least, be aimed at.

The sources of possible toxic absorption must be carefully searched for, notably in the frontal sinuses, the maxillary antra, the tonsils, the teeth, the appendix and, above all, in the intestine. Constipation must be corrected, preferably by dieting, where it exists.

And finally, a word or two about diet. We have been in the habit, and rightly so, of insisting on the abstinence from "high living." We have sought to curtail the amount of meat that sclerotic patients take. We interdict stock soups and rich sauces. We do not, however, restrict articles, which it would appear, are perhaps even more harmful, namely, milk, cream, eggs, and butter. Now it is obvious that we cannot prohibit altogether the various

articles of diet that are "suspect," for, in avoiding the Scylla of arterial degeneration, we may find shipwreck on the Charybdis of malnutrition. But we should draw up precise instructions for our patients, advising them what articles should be prohibited, and what materially restricted. It is not enough to say "Do not take much of this," or "Go easy on that." Specify the amounts that may be taken, and the frequency with which they are to be taken. Also, the habit that some people have acquired of swilling themselves with large quantities of tea or water, with the idea of "flushing out the kidneys," is not altogether justifiable. In the case of those with developed selerotic changes, or with "vital rubber" of poor quality, such a practice may be positively harmful.

A plain, simple diet, with restriction of the foodstuffs known to be harmful, and "moderation in all things," is the ideal to be striven for.

An Address on

THE PROMPT DIAGNOSIS OF PULMONARY TUBERCULOSIS*

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THE use of the word "early" as qualifying the diagnosis of pulmonary tuberculosis carries with it some ambiguity of meaning, as a prompt diagnosis as well as duration and stage of the disease are all implied. Early diagnosis may not be possible for anyone, but promptness in diagnosis is reasonably practicable for everyone. Since duration and extent are by no means closely correlated the term "minimal" has now supplanted the term "incipient" in classification. The experience of the past two decades shows that no early stage is recognizable in many cases of pulmonary tuberculosis. The omnipresent infection has become disease with no noticeable event to mark the change. The disease has developed along with an acquired resistance or a remarkable endurance until the balance is lost, disease triumphs, and tragic physical breakdown results. The patient then presents himself to his physician with a far advanced tuberculosis and if he has been to some extent under the doctor's casual supervision the latter is often unjustly blamed for an event, the development of which could not have been foreseen. Again, some unusual exertion may have been the cause of a haemorrhage at the site of an indolent tuberculous focus, with resulting broncho-pneumonia in a considerable area of lung from the aspiration of blood, or an aspiration of unrecognized tuberculous sputum may similarly have caused a broncho-pneumonia; or the rupture of a tuberculous gland into a blood vessels may have resulted in disseminated haematogenous tuberculosis. In such cases the diagnosis is all too clear. The prompt diagnosis, however, of the more insidious types of beginning tuberculous disease is a responsibility common to every practitioner, and, because of the prevalence of tuberculosis, one of the most important he has to face.

Despite the awakening of the public in regard to tuberculosis and the efforts of physicians during the past twenty years to reach an early diagnosis, the admissions to sanatoria show no material change in the proportions of types admitted. They average about 20% minimal, 35% moderately advanced, and 45% advanced. Sanatoria were forced at an early date to accept other than the recoverable cases for which they were originally built and now make an even less rigid selection since beds have been increased in number. The introduction of the x-ray into diagnosis has also brought about a more severe grading of cases. A recent analysis of a group of one hundred civilian patients from Ontario, in average comfortable circumstances, admitted to a sana-

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torium, shows 18% minimal, 44% moderately advanced, and 38% far advanced cases. The diagnosis had been made promptly in 48%, was delayed in 24%, and was negligent in 28%. Credit should be given for an additional ten per cent of cases referred as tuberculous which proved not to be so.

While the tuberculosis death rate in Ontario has fallen 52% since the beginning of the century, and from first place as a cause of mortality to third in all its forms, it is still the cause of 6% of deaths. Practitioners in Ontario have yet to consider that there are upwards of 2,000 deaths from tuberculosis in all forms annually which include more than 1,700 deaths from phthisis. With a death rate of 87 per 100,000 for the whole of Canada, similar responsibilities in the other provinces vary from a minimum in Saskatchewan to a maximum in Prince Edward Island. The investigations of recent years now permit deductions to be drawn from the death rate in regard to the amount of tuberculous illness. In any community one may estimate that the number of active cases is at least seven times, and that arrested cases are at least ten times, the number of deaths. Therefore in Ontario to-day we have upwards of 14,000 cases of active tuberculosis in all forms (more than 12,000 of these being cases of active phthisis) and more than 20,000 cases of arrested tuberculosis. I have estimated, from the facts at present known, that a yearly crop of new cases of from one and a third to one and a half times the death rate is required in order to maintain the status of tuberculosis in a community. For Ontario this would be a minimum of 3,000 new cases annually. The status for Canada will be roughly represented by multiplying these figures by three.

The great reduction in deaths from tuberculosis during the past two decades began with the inception of the anti-tuberculosis campaign for education, segregation, and treatment. While other influences have played a part the campaign has probably been the principal one, as is shown by the most marked reduction where the greatest effort has been made. There infectious cases are segregated and contacts searched for. In the cities of Ontario where an active campaign has been waged, the decrease has been amazing, Toronto having reduced its death rate 72% in twenty-one years and Hamilton almost as much, with a still further reduction of 33% even in the past two years. The distribution of tuberculous deaths in the province is now less in the cities, remains the same for the towns, and is relatively greater in the country than a decade ago. More than half the population of Ontario lies outside the cities where the most intense effort has been made. Physicians have played a most important part not only in the campaign in general but in the detail of recognizing disease and placing patients under treatment. In the cities they are now assisted by special clinics and nurses. It is in the country that progress rests wholly upon the practitioners.

For the prompt recognition of pulmonary tuberculosis it is of the greatest importance that the point of view should be kept constantly in mind that there is a widespread biological implantation of tubercle bacilli, as shown by tuberculin tests, varying from 40% in children of school age to double that amount in adults, and that this basic infection may at any time become of clinical importance as tuberculous disease.

So much has been written upon the diagnosis of tuberculosis in the past thirty years that the subject has become commonplace and lacks interest. It has been discussed in such great detail that the essential practicable methods have become somewhat obscured and the subject is perhaps regarded as belonging to the so-called tuberculosis specialist rather than to the practitioner. For progress to be made, however, it is necessary that the practitioner should realize that he is the most important factor in the fight. He must have the conviction that there is tuberculosis always cropping up that should be recognized, and that in most instances can be diagnosed by methods that he is fully competent to use. I believe that he can diagnose four out of five cases at least without reference to a general consultant or to a physician skilled especially in chest work. Our histories show that doctors are prone to let the opinion that tuberculosis is the cause of illness, which might reasonably be formed from the history, be overruled because they are unable to demonstrate physical signs in the chest or tubercle bacilli in the sputum, usually from only a single examination.

In such cases it is clear that anxiety should not be dulled until a satisfying diagnosis can be made, and that precautionary measures for the prophylaxis and safe treatment of tuberculosis should be put into effect while the diagnosis is in doubt. An occasional wrong diagnosis is safer for the individual than one missed. It is fully recognized that this necessary period of observation involves difficulties as to time, opportunity and cost.

The essentials upon which a reasonable diagnosis may be founded are, an adequate history, a sufficiently detailed enquiry into present symptoms, a general physical examination with special attention in some few details to the lungs, observation in regard to temperature, pulse and weight, the prompt and repeated examination of the sputum, and possibly an x-ray examination. The safely applied tuberculin tests are mainly helpful for exclusion when negative on repetition; when positive they may prove a stimulus to further investigation.

Of first importance is a well-taken history, with events recorded in chronological order, as regards a general survey of the personal history and past illness and also the functioning of the special systems. The history should, as a matter of routine, follow a good schema in order to avoid missing points. The patient's statement regarding the diagnosis of past, personal and family illnesses may be open to question and should be criticized. Every lead should be followed to a conclusion so that some concrete opinion may be formed regarding an illness, actual or possible, at different stages of the history. Thus, when taken with an open mind, the history prepares for diagnosis by elimination, and, from the tuberculosis standpoint, becomes of prognostic importance. The taking of a history is too frequently regarded as a boresome routine, but it is the key to most diagnoses which other methods only confirm.

It is almost unnecessary to refer to the possible importance of contact infection obtained through an enquiry into family history about phthisis and other pulmonary diseases that may have concealed it, also regarding such diseases in other members of the household. The method of feeding in infancy, the purity of the milk supply in childhood, and the habits of later life may also be of moment.

Respiratory infections, past or recent, and their possible complications deserve thorough enquiry. True influenza has been the exciting cause of many cases of tuberculosis in recent years. The recurrent attacks of so-called "grippe" may really be tuberculous. Such cases, and those with the history of recurrent chest colds, require examination. Pleurisy that occurs without definite recent acute respiratory infection should be considered tuberculous. Dry pleurisy, usually indicated by chest pains, suggests the presence of an underlying tuberculous lesion that may be found, and the wet pleurisy has been shown to be an immunity reaction in a patient already tuberculous. Ledamany, twenty-seven years ago, proved that 92% of insidious effusions were tuberculous. About one-third of cases of pleurisy with effusion later develop phthisis. Enquiry may elicit suggestive information of previous tuberculous disease in the history of glandular enlargements, with or without suppuration, bone or joint disease, a purulent otitis of insidious origin, and anal fistula, the result of an ischiorectal abscess. About 10 per cent of these have been demonstrated to be actually tuberculous. The history of past ischiorectal abscess is fairly frequent in phthisical cases, but too rarely has it been regarded as significant of possible pulmonary tuberculosis, and the patient examined at the time. The history of irregular attacks of diarrhoea alternating with constipation may point to intestinal tuberculosis or tuberculous peritonitis; and that of haematuria, perhaps with pyuria, to tuberculosis of the urinary tract. The tubes, prostate, and testicles are not to be forgotten.

Enquiry about suggestive symptoms and repeated examination would save disaster if regarded as essential during pregnancy and lactation. Many latent cases of tuberculosis become active during pregnancy. Obsolete infections gain fresh dissemination caused by the strain of parturition, and the drain of lactation predisposes to the development of a latent into an active focus, or furthers the development of recently disseminated bacilli.

The patients with histories of unexplained febrile attacks, recent indigestion, anaemia, asthenia, and neurasthenia all require investigation, since tuberculosis may be the cause of all such symptoms.

It should not be forgotten that tuberculosis may be a concomitant of other disease and that while the patient is being treated for one disease he may be developing another. Indeed, the primary disease may well have been the cause of breakdown of an already existing latent tuberculosis. Every diabetic should receive a careful chest examination and every tuberculous patient a careful urinalysis.

Symptoms referable to the respiratory system should give warning for thorough physical examination. Hoarseness, or pains on swallowing, demand a laryngeal examination, when the diagnosis of tuberculosis may at once be clear. A cough that persists more than a month, with or without sputum, requires a chest examination, and persistent sputum even without cough should receive repeated laboratory examinations. A history of blood-stained sputum or of blood spitting, past or recent, should in this country be considered tuberculous unless another explanation can be definitely found. The patient is too often quieted with the assurance that the blood has come from a bleeding point in the throat. Only once have I seen such an explanation possibly justified. Such cases should receive thorough investigation. It may be difficult or impossible to discover any area in the lungs that is responsible for the haemorrhage. Slight dyspnoea may on examination prove to have been a significant symptom. Vague or localized chest pains may direct to an underlying pleurisy, possibly at some distance from the site of pain.

Constitutional symptoms of importance, significant of toxaemia, but which may also be characteristic of non-tuberculous focal infections elsewhere in the body, are fever, slight or marked, night sweats, chills, acceleration of pulse, loss of weight, languor, lack of endurance, anorexia and indigestion.

A general physical examination, including examination of the nose, throat, and larynx, is of course always desirable. I shall, however, limit myself here to the discussion of but one method of physical examination, important though all the procedures in chest examinations are. Auscultation for râles is the most important of all methods of examination in the detection of an early tuberculous lesion. Care must be taken to elicit râles not ordinarily heard during respiration. At the end of a moderate inspiration the patient should be asked to expire fully, giving a single short cough which is to be immediately followed by a moderately deep inspiration. Râles will then be elicited after cough and at the beginning of inspiration which may not be detected otherwise. This manoeuvre is of the greatest importance. The râles will be heard in a shower at the end of a cough or scattered during the early phase of inspiration, of sub-crepitant type, mixed very possibly with larger râles scattered throughout inspiration, some of which may only be heard toward the end of a full inspiration. The elicitation of such sub-crepitant râles is of the highest importance and is significant of a broncho-pneumonic area indicating tuberculous infiltration. Larger moist râles are also increased and to be noted in areas that otherwise may be silent. Râles to-day are considered the earliest diagnostic signs of tuberculous infiltration; modification of breath and voice sounds are later signs. The areas above the third rib, the high axillary regions, the supra-spinous fossae, the inter-scapular regions and at the angles of the scapulae, should be carefully auscultated for such râles. Pleuritic râles are sometimes difficult of differentiation; they are usually unaffected by cough. Atelectatic râles at the apex, along the sternum, and along the lower lung margin will usually be removed after a few deep breaths. Skin and hair crackles (eliminated by greasing the skin), muscle sounds or fibrous tissue sounds, and crackles near the sterno-clavicular and first rib joints may cause some confusion. These may be recognized by a manipulation of the shoulder with auscultation while the breath is held. The joint sounds may be conducted some distance from the sternum. The method of auscultation during and after expiratory cough is by far the best available single method that we possess for the detection of pulmonary tuberculosis. If combined with intelligent inspection the greater number of cases of tuberculosis would be recognized.

A period of investigation will be desirable in a suggestive case, during which observations of temperature, pulse and weight are made, the sputum collected for laboratory examination and physical examination repeated.

XUM

A record of temperature, taken by the patient or an attendant, is essential. A period of a week at least is desirable, at the hours of 7 a.m., 12 m., 4, 6, and 8 p.m. Women will frequently show a pre-menstrual rise beginning as long as ten days in anticipation of menstruation. It may be desirable then to take the temperature for a whole menstrual cycle. The occasional taking of the temperature in the office is of little value. The temperature should not be taken within half an hour of having had anything to eat or drink, of any smoking, nor of being out of doors. The morning temperature should be taken before brushing the teeth. The method of taking the temperature is nearly always faulty, for here we are trying to obtain a record of slight variations. A temperature of 99° will not register necessarily under ten minutes. A thermometer that registers 99.5° may show 100° in ten; a temperature under 99.5° may not register above normal in three minutes. Small temperature rises are therefore missed because of too short a time, and this obtains with any type or make of thermometer. The bulb of the thermometer should be warmed on the tip of the tongue before being placed under it. The thermometer should not be removed from the mouth until the full period has elapsed. The chewing of food or gum will increase a mouth temperature half a degree or more in fifteen minutes which will require three-quarters of an hour to fall. There is a distinct relationship, as a rule, between the morning and afternoon temperature, and a relatively high morning temperature will usually suggest what the afternoon temperature will be. In cold weather especially the rectal temperature is the more reliable; it averages from 0.6° to 0.8° higher than the mouth temperature.

The pulse should be recorded at the same time as the temperature, after resting half an hour. It is a more sensitive index of toxaemia than the temperature, but external influences are less easily avoided.

Weight is to be considered in regard to height and age and its fluctuations at noteworthy periods of the history. The patient should now be weighed at fortnightly intervals, if possible in the same clothes, at the same hour of the day, and on the same scales.

Sputum, if present, should at once be collected, sent to the provincial or municipal laboratory, or examined at the office of the physician. Sputum that is coughed up from the chest perhaps at more than one period of the day should be collected, and post-nasal secretion avoided. Due care should be given to the selection of likely particles—a prolonged search of the slides is necessary. One should not be content with less than three negative examinations. No assurance that the patient is not tuberculous can be given from a negative examination, and such assurance may not be justified even if many negatives are found. Concentration tests are desirable when possible. That of Andrus, recently published, is a most efficient method. If still negative, guinea pig inoculation at a laboratory is desirable. This will require the lapse of a month before the result is known. Where the doctor fortunately does his own examinations, the search for elastic tissue should not be forgotten in negative cases. The conclusive test for a diagnosis of pulmonary tuberculosis, the examination for bacilli, is unfortunately often neglected. A specimen bottle in a mailing case can easily be carried in the bag at all times. In my own series of cases sputum had been examined before admission in 90% of those who had sputum. In 15% the finding of the tubercle bacillus was of importance in making the diagnosis. In the remainder it was simply confirmatory. It might possibly have been diagnostic in a number of cases had it been used earlier. In 1921 the provincial laboratories examined more than 5,000 specimens of sputum, of which one-seventh were positive. In a decade the use of the provincial laboratories for sputum examination has more than doubled. In this decade also the use of municipal laboratories has increased. With the annual occurrence of 1,731 deaths from pulmonary tuberculosis and the 1,094 deaths from chronic bronchitis, asthma, empysema, and broncho-pneumonia (above the age of five years), and an estimated 12,000 cases of active phthisis at any time, besides the many cases of chronic respiratory disease in patients above middle age, in whom the death rate from tuberculosis is almost as high as in early adult life, there is evidently need of a much greater use of this easily applied method of diagnosis. The finding of bacilli in sputum is not to be regarded

as an early sign, but if bacilli are detected a positive diagnosis is at once made before the disease becomes more advanced. For the protection of the family and associates, especially children, it is momentous to know whether a patient with chronic expectoration is expectorating bacilli. If the sputa of patients suffering from so-called chronic bronchitis or other chronic respiratory disease were consistently searched, a much greater number of centres of infection would be exposed.

The x-ray should be regarded as supplementary and complementary to physical examination. It gives a great sense of security. No chest examination can be considered complete without an adequate reading of a pair of good stereoscopic plates and a screen examination. Unfortunately when easily accessible there is a great temptation to disregard a good history and to make a much less thorough physical examination. It is highly probable that anyone who works much with the x-ray will find his acuteness in physical examination deteriorating. This is because the revelations of the x-ray are so often humiliating to even a careful examiner that he develops a feeling of insecurity about his physical examination. Central lesions are revealed which are beyond the reach of the stethoscope and percussion. A lesion beyond 1 5/8 inch from the surface of the lung cannot be recognized by ordinary clinical means. A compensatory emphysema may obscure more superficial pathological change. In half the cases examined the x-ray will show a greater lesion than can be demonstrated by physical examination. It reveals the history of the chest in regard to past inflammations, as well as recent and present ones. It is of great prognostic importance because of this and since it shows fairly the extent of present disease it helps to relieve from suspicion certain areas where transmitted respiratory sounds, voice sounds, and râles are heard. In anything but a minimal lesion the x-ray will either show more than physical examination or will help to a truer perspective of the case; but in regard to the minimal lesion one may be quite as much at a loss with it as without it. Where the question of differential diagnosis comes in it is of value in pointing to some other cause than tuberculosis for the lesion, or in quieting suspicion in regard to some other cause. In the case of children, especially, a careful history and examination are necessary preliminaries to the interpretation of the x-ray report, since shadows due to various acute respiratory infections and to the lymphatic absorption from the tonsils, somewhat slow in subsiding, are confusing but are not tuberculous. When an x-ray examination is used, good stereoscopic plates should be required, which should be interpreted if possible by a man of large experience. The report should be combined with the results of clinical examination, a conservative ground taken in regard to the evidence of calcification and fibrosis at the hilum, and of peribronchial thickening—the result probably of an obsolete lymphangitis—but a full value given to the sometimes slight shadows suggesting parenchymatous disease. Interpretation in regard to minimal lesions may be misleading except by the experienced. The screen is valueless and misleading in regard to an early diagnosis; it is confirmatory and useful for the grosser lesions. Since relatively inexpensive there may be temptation to use it instead of plates. The considerable expense of an efficient x-ray examination should be incurred only when justified by the inconclusiveness of other examinations.

The diagnosis of tuberculosis in many cases is hard and will require the full battery of methods of clinical examination in expert hands to verify it or to eliminate it and reach a satisfying diagnosis. Old tuberculosis not now active, the focal infections at their various sites, possible systemic infections, and endocrine disturbances present special difficulties.

The criticism may be fairly made that sanatorium men have but little experience of the difficulties of general practice, of the prejudice often aroused against the doctor for making a positive or tentative diagnosis of tuberculosis, and that my suggestions, fragmentary and incomplete as they are, will prove to be too time-consuming to be practicable; that the cases of possible phthisis are too few in any one man's practice for him to be always on the alert, and that the patient is suspicious of examinations that must be an additional expense. The economic relationship between the patient and physician, always a matter of concern, is especially serious in this disease. It is impossible to suggest anything helpful that does not involve work, practice and time; but we must put punch into our diagnosis if we intend to win this fight.

THE TREATMENT OF OBESITY

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THE condition termed obesity is very widespread and perhaps deserves more recognition than it is at present given. The incapacity that obese people suffer from may be extreme, making it practically impossible for them to function as useful citizens. For such reasons and for others, depending upon the obese state, it not infrequently happens that it is wise to "reduce" these individuals.

We now recognize two types of obesity: (1) the exogenous, or simple obesity, and (2) the endogenous, or obesity secondary to some endocrine or other pathological disturbance. The first type of obesity, the exogenous, depends for its exciting cause upon a disproportion between the intake of food or other heat yielding substances, and heat production. Frequently these individuals have the habit of eating large quantities of fat-forming foods; this with very little exercise. Some give the history of having been excessive alcohol consumers (1 grm. alcohol supplies 7 calories). With the increase of weight less exercise is taken. Thus a vicious circle develops.

The symptoms of exogenous obesity are as a rule mechanical at first, then cardiac, as the increased load tells upon the heart. Frequently in women menstrual disorders appear with amenorrhoea and sterility. With the reduction of their weight the menstrual cycle is re-established. A study of their heat production shows that they produce heat in proportion to their surface area as established by Means in his series of twelve cases. This fact is of great assistance in determining the type of obesity at hand.

Endogenous obesity, the second type, has a definite pathological basis, it usually being an endocrine dysfunction. Its symptoms are in part related to the endocrines at fault and in part due to the obesity *per se*. The basal metabolism is low, frequently minus 25 to 40 per cent. This decreased heat production tends towards the storing of fat. (For example—in a female thirty-five years old with a surface area of two square metres the basal production of heat should be 1,752 calories per day. A basal metabolic rate of minus 25 per cent would save 438 calories per day or 159,870 calories per year. In pure fat this would represent 17,190 grms. or thirty-eight pounds). Thus one can see the great tendency to gain weight.

The treatment of obesity should be confined to those of the exogenous type. Children, adolescents, and old people do not stand "reduction cures" well. In all cases care must be taken to estimate any cardiac damage, and to prevent its progress in any treatment undertaken. As usually employed it is based upon the following principles:—

(1) Use of a subcaloric diet with the maintenance of nitrogen equilibrium, restricting the supply of fat and carbohydrate.

(2) Increasing heat production by exercise, hydrotherapy and massage.

(3) Drugs: thyroid extract to raise the basal metabolism, thereby increasing heat production. This method usually results in a very slow reduction in weight, its advocates claiming that it is unwise to lower the protein intake below 100 to 120 grm. and the caloric intake below 1/4 to 1/5 of the daily requirements. The use of thyroid extract outside of the well controlled clinic I think is pernicious, as it frequently leads to material cardiac damage when taken for long periods of time. When the patient can be followed through daily observation and frequent basal metabolic rates it materially aids the rapidity of weight loss, and under such conditions may be safely employed.

In our clinic a rather radical procedure has been adopted in the treatment of a series of cases of exogenous obesity. It is based upon the following principles:—

1.—Diet: subcaloric with an attempt to lower the nitrogen exchange, no attempt being made to maintain nitrogen equilibrium.

2.—Increase heat production by exercise, hydrotherapy and massage which will not increase protein catabolism.

3.—The use of thyroid extract, attempting to maintain the basal metabolic rate at plus 10 per cent.

The results of this work have been so uniformly satisfactory that we wish to report three cases in detail.

Case I.—The first case was a Hebrew woman of twenty-nine years, admitted to the hospital May 19, 1921, weighing 109.99 kg. (241.9 lbs.). Her weight at marriage six years before, was 160 lbs. Shortly afterwards she began to grow stout, her menstruation became irregular and she suffered from dyspnoea on exertion. She desired to have a child but had never been pregnant. Physical examination showed a normal heart and sella turcica, the blood pressure was systolic 110, diastolic 82, and her basal metabolism was minus 10 per cent.

She remained in the hospital for 117 days, the total loss of weight being 31.36 kg. (69 lbs.). No untoward cardiac symptoms developed. Shortly after discharge menstruation reappeared, she became pregnant, and delivered a normal child. Her activity is normal, and with a controlled diet she has continued to slowly lose weight, it now being 72.7 kg. (160 lbs.).

The results obtained are well shown in Table I, it being noted that the nitrogen studies were started on May 28, 1921.

See Table I.

The caloric intake in relation to the loss of weight is shown in Table II. The calories derived from protein are figured from the urinary nitrogen.

See Table II.

The basal rates and the thyroid administration are shown in Table III. An attempt was made to keep the basal rate at about plus 5 per cent. No marked symptoms of overdosage with thyroid extract were noted, but at times the dose had to be decreased due to slight tremor or nervousness.

See Table III.

Case II.—The second case was a Hebrew woman aged 31. When married twelve years before she weighed 160 lbs. During the first two and one-half years after marriage she had two children, but since then with her increasing weight her menstruation has become irregular, and she complains of shortness of breath and weakness of legs. She was admitted to the hospital on Nov. 14, 1921, weighing 123.63 kg. (271.9 lbs.). Upon discharge March 5, 1922, 107 days later she weighed 87.27 kg. (191.9 lbs.), the loss of weight being 35.68 kg. (78.5 lbs.). Physical examination showed a normal heart, the blood pressure was 140/76. The sella turcica was normal and the basal metabolism was plus

TABLE I

Date	*Intake Protein*	*Urinary Nitrogen*	*Weight*	*Remarks*
1921	grm	grm	kilos	
May 19	.....	.....	109.99	Admitted
May 28 to 31	402.0	66.86	107.49	(Weight May 28th.)
June 1 to 30	1368.0	257.57	.....	
July 1 to 6	359.4	131.69	.....	
" 11 to 31				
Aug. 1-31	372.1	118.18	.....	
Sept. 1-16	62.9	57.79	78.74	(Weight Sept. 16th.)
Sept. 17	.....	.....	78.63	Discharged
Total	2564.4	649.99		
Average per day (108 days)	23.7	6.02		

Total loss of weight = 31.36 kg.
Loss of weight May 28th. to Sept. 16th. (108 days) = 28.75 kg.
Average loss of weight per day (108 days) = 0.266 kg.

TABLE II

Total Calories Supplied to Body—May 28th. to Sept. 16th. (108 days)

Protein (from N. output in urine	= 4063 x 4.1	= 16,658
Fat (from fat intake)	= 573 x 9.3	= 5,338
C.H.O. (from C.H.O. intake)	= 4528 x 4.1	= 18,564
Total		40,560
Average per day		376

TABLE III

Date	*Surface Area*	*Basal*	*Thyroid Extract*	*Administration*
1921	Sq. M.		Date	Amount
May 21	2.09	−10		
" 25	2.08	+2.9	May 22 to 31	gr. III per day
" 28	2.076	+1.3		
June 2	2.075	+3.5	June 1 to 2	gr. XI " "
" 9	2.06	+2.4	" 3 to July 6	gr. XIV " "
" 14	2.052	+4.3	July 11 to 29	gr. XII " "
" 22	2.035	−0.2	" 30 to Aug. 3	gr. VI " "
" 29	2.01	+8.4	Aug. 4 to 5th.	gr. XII " "
July 6	2.00	+8.6	" 6	gr. IV " "
" 21	1.97	+4.6	" 7 to 10	gr. XII " "
Sept. 1	1.865	−6.7	" 11	gr. IV " "
			" 12 to 15	None given
			" 16 to 17	gr. VI per day
			" 18 to Sept. 16	gr. IX " "

Averaging all basals.
Average surface area = 2.0223 sq. metres.
Total calories per sq. m. per hr. = 38.087
Total calories per hr. = 77.013

Total calories per 24 hrs. (day) (Basal) = 1848 (Average)

TABLE IV

Date	*Intake Protein*	*Urinary Nitrogen*	*Weight*	*Remarks*
1921	grm	grm	kilos	
Nov. 15 to 30	1167.6	205.02	122.95	Admission
Dec. 1 to 31	1312.9	272.48		
Jan. 1 to 31	630.5	174.11		
Feb. 1-7-28	587.4	113.55		
Mar. 1 to 5	85.2	20.89	87.27	Discharged
Total	3783.6	786.05		
Average per day: (106 days)	33.8	7.41		

Total loss of weight = 35.68 kg.
Average loss of weight per day (106 days) = 0.337 kg.

TABLE V

Total Calories Supplied to Body—(Nov. 15th to March 5th).

Protein	(from N. output in urine)	= 4912 x 4.1 = 20,139
Fat	(from fat intake)	= 1185 x 9.3 = 11,020
C.H.O.	(from C.H.O. intake)	= 4981 x 4.1 = 20,422
	Total	51,681
	Average per day (106 days) =	487

TABLE VI

Date	*Surface Area*	*Basal*	*Thyroid Extract*	*Administration*
1921	Sq. M.		Date	Amount
Nov. 16	2.17	+6	Nov. 19 to Dec. 6	gr. VI per day
" 28	2.10	+21	Dec. 7 to 10th.	gr. IV " "
Dec. 14	2.06	+10	" 11 to 15	None given
" 29	2.04	+18	" 15 to Jan. 26th.	gr. IV per day
1922			Jan. 27 to Feb. 13	None given
Jan. 10	2.00	+17	Feb. 14 to Mar. 5	gr. IV per day
Feb. 14	1.93	+8		

Averaging all basals.
Average surface area = 2.05 sq. metres
Total Calories per sq. m. per hr. = 41.3
Total Calories per hr. = 84.665
Total calories per 24 hrs. (day) (Basal) = 2033

6 per cent. Since discharge, by keeping to a moderately subcaloric diet, she has lost about 25 lbs., and she is very well and active.

Table IV. shows the nitrogen metabolism during the total hospital period.

See Table IV.

The total caloric intake with its division is given in Table V, while Table VI gives further data of importance.

See Tables V and VI.

Case III.—This case was a white woman, a school teacher, fifty-one years of age. She was

quite normal up until four years of age when she began to grow stout, always continuing to be over weight. As a child and while a middle aged woman she was active and enjoyed a normal amount of exercise. The history reveals no dietary excesses. Menstruation began at thirteen years but tended to be irregular. This irregularity has been more marked during the last five years. Lately (for three years) she has found exercise too tiring, resulting in palpitation and dyspnoea. Her weight in June, 1922, with street clothes was 397 lbs. She was admitted to the hospital on Oct. 2, 1922, with a net weight of 172.94 kg. (380.5 lbs.). Physical examination showed that the adipose tissue was generally distributed over the body, being especially marked over abdomen, buttocks, thighs and chest. Height: 5 ft. 6¾ inches. The lungs were negative. Heart was of normal size, with sounds of good quality, and no murmurs were present. Pulse was 80 and regular. Blood pressure 112/75. No organs were palpable in abdomen. No oedema of legs. Nervous system was negative. Urine was negative. There was no anaemia. The electro-cardiagram showed a slight right-sided

TABLE VII

Date	*Intake Protein*	*Urinary Nitrogen*	*Weight*	*Remarks*
1922	grm.	grm.	kilos	
Oct. 3 to Nov. 2	868	276.7	171.6	
Nov. 3 to Dec. 2	762	183.0		
Dec. 3 to 29	909	164.2	138.4	Discharged
Total	2539	623.9		
Average per day: (88 days)	28.85	7.1		

Total loss of weight = 43.2 kg.
Average loss of weight per day (88 days) = 0.491 kg.

TABLE VIII

Total Calories Supplied to Body—(Oct. 3rd. to Dec. 29th.)

Protein	(from N. output in urine)	= 3899 x 4.1 =	15,986
Fat	(from fat intake)	= 898 x 9.3 =	8,351
C.H.O.	(from C.H.O. intake)	= 1664 x 4.1 =	6,822
		Total	31,159
		Average per day (88 days) =	354

TABLE IX

Date	*Surface Area*	*Basal*	*Thyroid Extract*	*Administration*
1922	Sq. M.			
Oct. 4	2.62	+2.8	Oct. 7 to 26th.	gr. VI per day
" 16	2.567	+3.3	" 27 to 30th.	gr. IX " "
" 29	2.546	+3.1	" 31 to Nov. 17th.	gr. XII " "
Nov. 16	2.515	+16.6	Nov. 18 to 27th.	None given
" 28	2.48	-8.0	" 28 to Dec. 11th.	gr. IX per day
Dec. 12	2.452	+5.1	Dec. 12 to 20th.	gr. XII " "
			" 20 to 29th	None given

Averaging all basals
Average surface area = 2.53 sq. metres.
Total calories per sq. m. per hr. = 36.33
Total calories per hr. = 91.91
Total calories per 24 hrs. (day) (Basal) = 2206.

TABLE X

Case	*Protein Intake*	*Urinary Nitrogen*	*Tissue Loss*	*Protein*	*Tissue*	*N. Loss*	*Loss Weight*	*Total Calories Supplied to Body*	*Weight On Admission*
	per day grm.	per day grm.	per day grm.	Total grm.	per day grm.	Total grm.	per day kg.	per day	kg.
I.	23.7	6.02	13.9	1499	2.22	239.8	0.266	376	109.99
II.	33.8	7.41	12.5	1325	2.00	212.0	0.337	487	123.63
III.	28.85	7.10	15.5	1360	2.48	217.6	0.499	354	172.94

NOTE: All Nitrogen data is based on urine alone. Stool Nitrogen has been neglected.

preponderance. By x-rays the sella turcica appeared a little small. Otherwise the examination was unimportant.

Table VII shows her nitrogen metabolism while in the hospital for eighty-eight days on a subcaloric diet.

See Table VII.

Further data follow:—

See Tables VIII and IX.

Since discharge by keeping to a subcaloric diet her weight has dropped to 127.8 kg. (280 lbs.). She is now carrying on her daily work in a normal manner and during the past summer was able to take a trip abroad. Her activity is much increased, and at no time has she suffered from any symptoms referable to cardiac damage.

Discussion.—It is interesting to observe that through the prolonged subcaloric intake the nitrogen exchange was markedly lowered resulting in a great conservation of body protein. Undoubtedly this could have been accomplished to a greater degree but for the thyroid administration which would tend to increase the protein combustion.

Summarized, the following results were obtained:—

See Table X.

From these data it can be seen that there is a direct relation between intake of protein and urinary nitrogen loss. Also, with the greater intake of total calories per day the tissue nitrogen loss is less. It would appear that the total caloric intake is not the determining factor in the rate of rapidity of loss of weight, but that the original weight of the individual plays a part. The greater the initial weight the more rapidly can a reduction be accomplished.

TABLE XI

Case	*Total Loss Weight (a)* kg.	*Total Loss Body Protein (b)* grm.	*Ratio* $\frac{b}{a}$ grm.
I.....	28.75	1499	52.1
II.....	35.68	1325	37.1
III.....	43.2	1360	31.5

If one determines the ratio between the loss of body protein per loss kilogram of body weight a definite relation is obtained. The greater the loss of weight, the less body protein was consumed per unit loss of weight. Also the ratio varies inversely as the degree of obesity or initial weight. This would be expected as the greater the obesity the greater the percentage of the total weight would be due to fat.

Conclusions.—In reducing obese individuals of the exogenous type it would appear that it is quite unnecessary to maintain them in nitrogen equilibrium. Subcaloric feeding does not result in a serious body nitrogen loss, as there is a marked tendency for the protein combustion to fall to a low level. The greater the initial weight the more rapidly can a reduction be accomplished, at the same time with less loss of body protein. An uncontrolled employment of thyroid extract for such purposes is to be condemned.

Achlorhydria in Pernicious Anaemia.—M. E. Shaw (*Quart. Journ. of Med.*, July, 1924, p. 319) considers that it has been established that absence of free hydrochloric acid from the gastric juice is a constant feature of Addison's (pernicious) anaemia. From examinations of the gastric juice in seven cases of pernicious anaemia, and estimation of the amount of hydrochloric acid required to reach the acid point, the author has been able to measure the degree of achlorhydria. In five cases of pernicious anaemia dilute hydrochloric acid was administered, made up into a palatable drink with lemon juice, sugar, and water, and the effect determined. Theoretical considerations based upon the estimation of the degree of achlorhydria suggested that about 2 drachms of dilute hydrochloric acid (*B.P.*) would remedy the deficiency. Experimental evidence showed that ½ to 2½ drachms restored the effective germicidal activity of the gastric juice in pernicious anaemia if given by the "continuous" method. A. F. Hurst considers that the achlorhydria of pernicious anaemia is the primary defect, and that it permits the passage of organisms into the intestinal tract, where the toxins of the disease are formed and absorbed. The object of treatment, according to this view, must be to restore the lost germicidal power of the gastric juice by remedying the lack of hydrochloric acid. —*Brit. Med. Jour.*

A STATISTICAL REPORT CONCERNING THE VALUE OF THE STUDY OF THE BLOOD CHEMISTRY IN THE ACUTE ABDOMEN*

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IN a preliminary report[1] sixteen cases of acute abdominal lesions, including general peritonitis, intestinal obstruction, and pancreatitis, were described in which observations were made on the blood chemistry, including estimates of urea nitrogen and creatinine, before and after operation.

Detailed analyses of the cases were made, corelating the clinical and laboratory data. The striking results obtained seemed to emphasize the importance of performing such laboratory tests as an aid in diagnosis, prognosis, and treatment.

Based upon such a small series, it was then unwise to formulate definite conclusions. The following points were, however, suggestive:

(a) In intestinal obstruction, whether mechanical or adynamic, in acute general peritonitis, and in acute pancreatitis, the concentration of urea in the blood rises above the normal, in spite of the presence of a normal kidney function.

(b) The rise in the blood urea is therefore attributed not to defective elimination, but to increased tissue destruction.

(c) The tissue destruction is probably due to the toxic effect of a proteose absorbed.

(d) The maintenance of a high blood urea in the presence of a normal kidney function is indicative of an unfavourable prognosis, in spite of amelioration of the clinical symptoms.

Since then 343 cases have been observed. The results obtained, though not of the same striking nature as in the first few cases studied, have justified the adoption of these laboratory tests as a routine in the clinical investigations of such cases in this hospital.

The object here is to present a statistical report of all cases with reference to prognosis.

*From the Department of Metabolism of the Montreal General Hospital.

The following table shows the combined results obtained:

Clinical picture	*No. of cases*	*Blood urea nitrogen increased*	
		No. of cases	*Per cent of cases*
Peritonitis	96	81	84.2
Obstruction	62	51	82.8
Pancreatitis	18	13	72.2
Acute appendicitis	138	0	
No peritonitis			
Gall Bladder and passages	29	1	

It will be noted that excluding all cases of acute appendicitis having no peritonitis, and also the gall bladder cases, with the exception of one, over eighty per cent of all cases of intestinal obstruction, peritonitis, and pancreatitis showed increased blood urea nitrogen. The urea nitrogen ranged from 28 to 147 milligrams per 100 cc. of blood, and as in the first series, the observed figures bore no constant relationship to the severity of the clinical signs and symptoms at the times the tests were made. An increase in the blood urea nitrogen was observed in some cases twenty-four to forty-eight hours before definite clinical evidence of obstruction or peritonitis was noted, and such increase was sometimes found stationary in spite of improvement in the clinical picture. In the majority of cases, where the increase was maintained, subsequent clinical symptoms developed and the cases terminated fatally.

An arbitrary danger level of 50 mgm. urea nitrogen per 100 cc. of blood was adopted and the mortality in the cases investigated was as follows:—

	No. of cases	*No. of deaths*	*Per cent*
Above 50 mgm. Urea—N. per 100 cc. blood	67	38	56.7
Below 50 mgm. Urea—N per 100 cc. blood	276	6	2.2

From these data the prognostic value of this test is obvious. In addition to the 343 cases

mentioned above, sixteen cases of chronic appendicitis were observed. The blood urea nitrogen in all of these was normal. Six cases of constipation were studied and all, except one in which constipation was induced intentionally during the treatment of an extensive burn over the buttock, showed no increase in the blood urea. This increase in the "burn case" may, however, easily be attributed to the burns, since two other cases of burns showed approximately the same increase 28 to 32 mgm. per 100 cc. blood.

Blood Sugar.—The estimation of the sugar content of the blood has been found of some value in the diagnosis of obscure lesions of the upper abdominal region as the following data indicate:

Number of cases observed—126.

Clinical picture	*No. of cases*	*Hyperglycaemia present*	
		No. of cases	*Per cent of cases*
Gall bladder and its passages	62	47	73.4
Pancreatitis	18	15	83.3
All others	44	6	13.6

The occasional association of glycosuria with acute pancreatitis has been recognized for a long time. Slight degrees of hyperglycaemia (0.14—0.16%) may, however, be present in the absence of glycosuria. In fact, only one case in all those recorded above showed a glycosuria. The finding of a mild degree hyperglycaemia has thus aided in the diagnosis of obscure cases of pancreatitis. Hyperglycaemia was found in over 75 per cent of all the cases of pancreatitis and lesions of all the gall bladder and passages.

The above findings also give strong support to the clinical view that in most gall bladder cases—in this series 70%—there is associated pancreatitis, though of a very mild type. Of the six cases including "all others" one patient was menstruating and two others had a generalized peritonitis, spreading over the pancreatic area. This may explain the mild hyperglycaemia found. The remaining three cases may possibly be potential diabetics. Thus though the finding of normal blood sugars in cases of upper abdominal lesions may have little or no significance, a finding of a hyperglycaemia has a definite diagnostic value.

The writer is indebted to the chiefs of the surgical services for their co-operation which made these observations possible.

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(1) RABINOWITCH, I. M., The prognostic value of the study of the blood chemistry in the acute abdomen, *Jour. Can. Med. Ass.*, March, 1921.

Diphtheria in the United States.—If our facts as to the cause of diphtheria, its prevention by the use of the Schick test and toxin-antitoxin, and its treatment by sufficient antitoxin given properly and early are correct, diphtheria is a preventable and controllable disease. It should have a low mortality wherever competent physicians are available. There are, as will be seen from the figures published, marked differences both in the number of deaths from diphtheria in various communities and in the tendency of the mortality rate to increase or decrease. The diphtheria mortality rate is considerably lower in southern cities, and this is believed to be definitely related to climatic advantages, since diphtheria is more likely to attack during periods of cold and rain. The figures now made available are a challenge to every city in the United States which has a diphtheria mortality rate higher than the strikingly low rate of New York City. That community decreased from a rate of 134.4 in 1890-1894 to 85.8, and then gradually to 58, to 40, to 28, to 21.8 and for 1920-1923, to 14.5. This must be taken as an indication that the intensive campaign in the scientific control of diphtheria waged in that city has yielded substantial and encouraging results. That these results are not wholly fortuitous is shown by the fact that a continuous decline in mortality from this disease has also been shown in Hartford, Conn.; Jersey City; Philadelphia; Newark, N. J., Baltimore and Cincinnati. The facts and the methods of control are available. It remains for the health officials and the physicians of cities which continue to have high death rates to show that similarly good results can be achieved by the intensive application of our scientific knowledge.—*Jour. Am. Med. Ass.*, Sept., 20, 1924.

THE USE OF CALCIUM CHLORIDE IN ARTERIAL HYPERTENSION

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Of recent research on calcium chloride the following is pertinent to the present study. Chiari and Froehlich[1] of Vienna have shown that a cat acting normally to adrenalin, if injected intravenously with a suitable solution of oxalic acid, has its blood pressure raised immediately from 110 mm. Hg to 180-190 mm., and does not react further to adrenalin. If a corresponding solution of calcium chloride be now injected intravenously, the blood pressure returns to 110 mm. Hg and the cat reacts normally to adrenalin. Rosenman of Vienna[2] has shown that if smooth muscle be placed in a calcium-free Ringer's solution, the tonus of the muscle increases as calcium is added, until the normal calcium concentration is reached. Further increase of calcium causes progressive decrease of tonus.

In 1921 Kramer, Tisdall, and Howland showed tetany in infants to be associated with calcium deficiency. In 1922 Tisdall[3] injected dogs intravenously with dibasic sodium phosphate solution in quantities of 144, 150, 170, and 150 mgm. of phosphorus per kilo weight, to cause a reduction of the serum calcium from 10.3 mgm. to 6.3 mgm. per 100 cc. of serum, an increase of one per cent of the serum sodium, followed by death of three of the four dogs. He also injected three dogs intravenously with a suitable solution of phosphoric acid (150, 150, and 180 mgm. of phosphorus per kilo weight) to give a reduction of serum calcium from 10.4 mgm. to 6.1 mgm. per 100 cc. of serum, and a reduction of serum sodium by ten per cent. The dogs remained normal. The changes of calcium and phosphorus were common to both experiments, and the toxicity of the first experiment accompanied the increased ratio of the sodium to the calcium.

In May, 1923, the writer observed clinically a marked diuresis and fall of blood pressure, after ingestion of 180 grains of calcium chloride daily. In June, 1923, Gamble, Ross and Tisdall[4] published results of the ingestion of calcium chloride by a healthy infant and by an infant with tetany showing increased excretion of sodium and water. In June, 1923, J. B. S. Haldane, R. Hill, and J. M. Luck, of Cambridge, England,[5] showed that the ingestion of large doses of calcium chloride or its analogue ammonium chloride gave rise to marked diuresis, acidosis, and fall of alveolar carbon dioxide.

In May, 1924, by the courtesy, and with the assistance, of Dr. V. Henderson the writer injected cats intravenously with solutions of dibasic sodium phosphate and phosphoric acid and found the following changes of blood pressure.

Experiment I.—In a cat weighing 2.3 kilos, an isotonic solution of $Na_2H.P.O.4, 12H_2O$, 52 grammes per litre was injected. The cat gave a mean blood pressure of 125 mm. Hg.

Time injecting	*Quantity injected*	*Mean B.P.*
1 min.	2 cc. solution injected	135 mm. Hg
9 "	55 " " "	110 " "
15 "	80 " " "	107 " "
30 "	80 " " "	90 " "

Experiment II.—A cat weighing 2 kilos. The solution injected was in a concentration of 13 grams H_3PO_4 per litre, this being the amount required to give an isotonic solution of the phosphate. The cat had a mean B.P. of 82 mm. Hg.

Time injecting	*Quantity injected*	*Mean B.P.*
2 min. 20 sec.	1 cc.	107 mm. Hg
5 " 10 "	4 "	87 " "
8 " 20 "	5 "	85 " "
14 " 40 "	10 "	62 " "
24 " 40 "	27 "	52 " "
28 " 40 "	30 "	47 " "
35 " 40 "	30 "	65 " "

In a preliminary experiment where the same sodium phosphate, and phosphoric acid solutions were used in the same cat, too rapid injection of phosphoric acid caused complete loss of blood pressure so that the animal had to be revived by adrenalin. At the end of the preliminary and second experiments phosphoric acid was rapidly run in and the cats died with symptoms of dyspnœa.

The Clinical Study of Ingestion of Calcium Chloride

The first seven cases cited here are from the out door clinic of the Toronto General Hospital; four with detailed histories varying from four months to more than five years, and three cases without previous observation. Later there are given three private cases with previous recorded blood pressures, and four without.

(By courtesy of Dr. G. Strathy)

Experiment	Year	Number of Observations	Average B.P. Diastolic	Average B.P. Systolic	Range of B.P. Diastolic	Range of B.P. Systolic
No. 1, H.F.P.	1918	1	130	210	130	210
	1919	3	109	180	100-120	160-190
	1920	1	100	160	100	160
	1922	3	104	169	100-110	162-180
	1923	2	105	186	100-110	180-192

1924 (Detailed)

Jan. 30 Diastolic 100, Systolic 196
Mar. 5 " 112 " 188
Gave calcium chloride 150 grains *per diem*.
April 16 " 92 " 144
May 3 " 88 " 138
May 14 " 88 " 134

No. 2, W. H. — 1924 For 11 observations the average B.P. was Diastolic 114, Systolic 161 and the range of B.P. was Diastolic 98-136, Systolic 130-200.
April 30 " 114 " 152
Gave calcium 150 grains *per diem*.
May 3 " 86 " 134

No. 3, Mr. S. — 1919 2 Observations Average Diastolic 110, Systolic 180
1920 2 Observations Average Diastolic 66, Systolic 148
1921 1 Observation Average Diastolic , Systolic 160

No. 3, Mr. S. — 1923 2 Observations Average Diastolic 95, Systolic 170
1924 (Detailed)
Mar. 26—Diastolic 110, Systolic 168
Gave calcium chloride grains 150 *per* diem.

Mar. 29—Diastolic 108, Systolic 160
April 3 " 90 " 158
" 5 " 82 " 140
" 9 " 88 " 134
" 16 " 82 " 134

No. 4, Mr. McL. Had retinal hæmorrhage and two reputed cerebral hæmorrhages.

Year	Number of Observations	Average B.P. Diastolic	Average B.P. Systolic	Range of B.P. Urine S G 1.005 Diastolic	Range of B.P. Urine S G 1.005 Systolic
1921	7	106	199	85-120	160-230
1922	28	110	220	90-120	198-240
1923	16	105	222	94-126	190-254
1924	3	110	207		

April 3—Diastolic 110, Systolic 220
Ordered calcium chloride 57 grains *per diem* which gave nausea and sense of muscular weakness. The patient developed toleration to the drug in three weeks.
April 30—Diastolic 104, Systolic 176
May 14 " 86 " 172

No. 5, Mr. C. — Has phlyctenulæ, an aneurism of the right carotid, but Wassermann is negative.

1924 April 2—Diastolic 118, Systolic 218
" 5 " 114 " 200
" 9 " 100 " 180
" 16 " 96 " 146
" 25 " 88 " 144

(By courtesy of Dr. G. Young)

No. 6, Mrs. S. — Has facial paralysis; on entry, specimen of urine recorded S.G. 1.005 with trace of albumin and hyaline granular and cellular casts.

1924 April 25—Diastolic 136, Systolic 250
Gave calcium chloride 180 grains daily which she took under protest.
April 26—Diastolic 136, Systolic 278
May 2 " 118 " 190
" 9 " 118 " 184
" 16 " 112 " 172
Urine S.G. 1.010, albumen still present.

No. 7, Mrs. C. — Had left hemiplegia a year and a half ago, is recovering muscular function On entry note made of presence of headache, general œdema and urine with S.G. 1.003 albumin present.

1924 April 29—Diastolic 132, Systolic 232
Gave calcium chloride grains 150 daily which produced nausea, arise of diastolic B.P. to 166 and a fall of systolic to 212. The calcium was withdrawn and 120 grains of magnesia given each morning.
May 1—Diastolic 166, Systolic 212
" 3 Returned to calcium chloride half dose
" 5—Diastolic 128, Systolic 176
" 9 " 98 " 164
Recumbent position. Urine S.G. 1.021, albumen absent.
" 13 " 120 " 176
Sitting posture
" 22 " 100 " 158
Sitting posture

Cases from Private Practice

No. 8, Mrs. R. — 1924 For two years had been treated for high blood pressure. With two exceptions (188 and 196) the systolic B.P. reported was between 200 and 240.
Feb. 6—Diastolic 124, Systolic 198
Gave calcium chloride 180 grains daily
Feb. 13 " 110 " 165
Mar. 6 " 88 " 146
" 27 " 76 " 142

No. 9, Mr. C. — Was first seen as case of arthritis and psoriasis.
Mar. 21, 1924. His blood pressure was: Diastolic 124, Systolic 218
He was given calcium chloride grains 180 daily.
Mar. 23—Diastolic 104, Systolic 182
" 25 " 92 " 160
April 1 " 96 " 168
" 8 " 86 " 154
" 8 An acute gout developed and the calcium dose was halved.
" 22 " 82 " 152
Calcium stopped.
" 24 " 88 " 144
May 1 " 90 " 154
" 1 Patient was advised to go to Muskoka.

No. 10, Mrs. N. — This case was under my care nine years ago. Systolic B.P. usually exceeded 200. Once on salt poor diet consisting largely of milk, B.P. fell to 178. Once on milk diet only and ten days rest in bed, it is said to have been 188.

1924 Mar. 26—Blood Pressure:
Diastolic 126, Systolic 192
Gave calcium chloride 180 grains daily
Mar. 29—Diastolic 112, Systolic 180
" 30 " 118 " 184
April 6 " 112 " 168
" 15 " 116 " 184
" 18 " 106 " 158
" 27 " 102 " 148
May 10 " 92 " 146

No. 11, Miss A. Is a sister of Mrs. N., and had a retinal hæmorrhage and pus in the urine. She had hypertension two years ago.

1924 April 15—Her blood pressure was:
Diastolic 116, Systolic 176
Ordered calcium chloride 180 grains daily but the patient took only 45 grains daily. The blood pressure was:
April 25—Diastolic 122, Systolic 182
April 26—Diastolic 122, Systolic 174
Dose of calcium chloride corrected to 180 grains daily.
May 10—Diastolic 98, Systolic 156

No. 12, Mr. H. Had a heavy deposit of albumin in the urine and some dyspnœa.

1924 Mar 17—His blood pressure was:
Diastolic 128, Systolic 182
" 25 " 132 " 178
Gave calcium chloride 180 grains daily
Mar. 31—B.P. Diastolic 98, Systolic 162
Let the calcium lapse for three days, but returned to it.
April 11—Diastolic 114, Systolic 172
" 16 " 118 " 164
" 23 " 112 " 168
A trace of albumin present
May 7 " 102 " 146
Albumin absent

No. 13, Mr. McA. This case had slight albumin, œdema of the ankles and lower eyelids.
Oct. 29—The blood pressure was:
Diastolic 128, Systolic 182
Urine; S.G. 1.015
Gave calcium chloride 180 grains daily
Oct. 31—Diastolic 110, Systolic 162
Nov. 5— " 110 " 174
" 19 " 112 " 168
Albumin and œdema absent
Continued treatment for three weeks but did not report results.

1924 May 3—Diastolic 80, Systolic 136
Oedema and albuminuria absent.
Urine S.G. 1.025. Had been on low meat diet, using milk freely.

No. 14, Mrs. Le R. This case reports previous nephritis but does not know the urine findings. She was under my care for a short time only.

1924—April 12—Her blood pressure was:
Diastolic 105, Systolic 150
Urine S.G. 1.014.
Trace of albumen present.
Gave calcium chloride 180 grains daily
" 14—Diastolic 83, Systolic 140
" 26 " 68 " 122
Urine S.G. 1.024. Albumen absent.

Summary

For briefness data have been omitted where not essential to the clinical picture.

Cases 6, 7, 12, 13, and 14 had albuminuria. In all but 6 the albuminuria disappeared.

In cases 4, 6, and 7 there was a low urine specific gravity at first and comparative intolerance of calcium. As the kidney function improved the calcium tolerance increased.

In the interim between reading and submission for publication of this paper, cases 1, 3, 4, 7, and 11 have shown further fall of blood pressure.

In No. 4 progress under calcium chloride had ceased. He was given ammonium chloride, 150 grains daily, with the result that his blood pressure fell to 88 in diastolic and 158 in systole.

References

(1) *Archives für Exper. Path. und Pharm.* Band, 64, p. 216. (2) *Klinische Wochenschrift.* YARGEND, L., No. 42. (3) *Journal of Biological Chemistry*, September, 1922. (4) *American Journal of Diseases of Children*, June, 1923. (5) *The Journal of Physiology*, London, England, June, 1923.

Again, the Operation for Hallux Valgus.—In consequence of his clinical experience, Albert H. Freiberg, Cincinnati, has set up for himself certain requirements for satisfactory operation, employing the principle of Hueter. The capsule of the joint should be opened in such a way as to provide a plastic flap which may be utilized for maintaining the adducted position of the toe. After any bony outgrowth on the mesial aspect has been chiseled off, the head of the metatarsal must be thoroughly exposed in the wound so that it may be properly dealt with. After the removal of the head, the end of the metatarsal should be reshaped. Care should be taken to remove all bone particles from the wound. The tendon of the extensor hallucis longus should be divided. The capsule flap should be overlapped to a degree providing for the maintenance of the adducted position of the toe. The wound having been closed, a splint should be applied for ten days in order to provide for the firm adhesion of the capsule flap. It is important to cultivate amplitude and power in flexion of the toe.—*Jour. Am. Med. Ass.*, Sept. 20, 1924.

THE CLINICAL SIGNIFICANCE OF VERTIGO*

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A PATIENT complains of dizziness. He states that motionless objects apparently move around him or that his own body appears to be moving in relation to surrounding fixed objects. When the attack is severe he says that he reels or staggers and feels that unless he can grasp some fixed object he may fall.

Before the patient proceeds any further in telling his story the careful practitioner has realized to his dismay that he has another of those bothersome cases of vertigo to deal with and he appreciates he is face to face with a problem which will certainly tax his powers to their utmost. He knows that it is his first duty to discover the cause of his patient's complaint. He therefore takes a great deal of trouble with the routine history and makes a most careful physical examination.

He then probably consults the most dependable system of medicine available and finds vertigo referred to under various headings such as arterio-sclerotic, aural, cardio-vascular, gastric, idiopathic, labyrinthine, Ménière's disease, migraine, neurasthenia, wax in the ear, etc. He emerges from a study of these references determined to allot his patient to one of the groups discovered. In most cases error is the result. The patient either recovers in spite of the doctor or comes to serious catastrophe.

To emphasize the importance of correct diagnosis I will mention two cases to illustrate the latter alternative. The first case, an old man, entered an ear clinic complaining of dizziness. He was thoroughly examined; his condition was diagnosed as labyrinthitis due to external irritation and he was marked for admission; but a senior clinician spotted the case, ignored the diagnosis, and using it for a demonstration of the associated middle ear condition converted the process into a diffuse suppurative labyrinthitis with rapidly fatal termination. The second was that of a four year old child who was treated by a pediatrician daily for six weeks for what he thought to be an ordinary otitis media. Owing to his ignorance of the significance of vertigo, this otherwise well intentioned physician did not notice the signs which must have appeared as the suppurative process gradually invaded the vestibule, the semi-circular canals, and then the internal auditory meatus outside the dura and finally ruptured internally causing a rapidly fatal meningitis.

Such mistakes arise because of the erroneous teachings regarding vertigo which still permeate the majority of our text books.

The anatomy of the vestibular apparatus has long been thoroughly known and in the past decade great advances have been made in the knowledge of its physiology. The greatest progress has, however, been made clinically. Definite syndromes have been established and more are in progress of being established.

Much remains to be learned. All of what is known can not be said in the twenty minutes allowed for this paper, but so much has been discovered in the past few years that it is worth while indicating the new lines along which investigation of a case of vertigo should be directed. The paper is brief—it makes no pretence at being scientifically accurate—but it attempts to present a scheme which may aid the general practitioner in arriving at a correct diagnosis.

Vertigo and giddiness is defined by Purves Stewart as a peculiar disagreeable sensation which results if our sense of secure equilibration is disturbed. The process of equilibration is a muscular act in which all the muscles in question are innervated by the cerebral cortex, the latter being again largely influenced by the cerebellum.

The consciousness of secure equilibration is

*Read before the Ear, Nose and Throat Section of the Ontario Medical Association at Windsor, May 30, 1923.

maintained by a continuous flow to the brain of afferent impulses from three main sources,—from the touch, muscle, and visceral sense,—from the eyes, and from the ears. Normally, these afferent impulses are in such harmonious relationship with each other that we are not aware of them. Let one source be destroyed and some disturbance of equilibrium results for a time; but the remaining two sources will soon entirely compensate for the one which has been removed. For example; the tabetic may suffer from great impairment of the touch muscle and visceral sense without necessarily experiencing a disturbance of equilibrium; a blind person has lost his visual sense but does not suffer from vertigo; and it is probable that cases exist whose semicircular canal systems have been totally replaced by scar tissue and who now experience no vertigo.

From this one might assume that the three sources are of equal importance for the maintenance of equilibrium. A moment's consideration will show that such is not the case. The dizziness which may accompany active disturbance of the visual or kinaesthetic sense can be relieved by various measures, such as by closing the eyes, or lying down, etc. But the dizziness which accompanies irritation of the apparatus of the internal ear will continue as long as the irritation persists. In one case of considerable notoriety the vertigo and vomiting were not relieved until the eighth nerve had been completely divided in the internal auditory meatus. Of the source of these afferent impulses the static labyrinth is the most important, the eyes next, and the kinaesthetic sense least.

It is well here to state that the aid in the maintenance of equilibrium obtained from both the visual and the kinaesthetic sense is only one of their many functions, while the sole function of the vestibular part of the internal ear is the maintenance of equilibrium.

Having explained the importance of the ear mechanism in the production of vertigo it must not be assumed that vertigo is caused only by irritation of the peripheral ear mechanism. Vertigo is a sensation perceived by consciousness. It may therefore result "from affection either of the higher cerebral centres or of the coordinating cerebellar centres or from affection of any of the afferent paths to the cerebellum." For the purposes of this paper we will group all of these and the peripheral mechanism under the shorter term the ear mechanism.

The physician might imagine from the references he has turned up that vertigo is a general disturbance accompanying "disorders of this, that or the other organ." It is not. Vertigo is a symptom. It is a disturbance perceived probably within a definite part of the brain just as sight and hearing are perceived in particular areas of the brain. It is a symptom that shows that the causal condition has affected the internal ear or the intracranial connections of the internal ear. Therefore one should never speak of cardiovascular vertigo, gastric vertigo, idiopathic vertigo, or use any other such generalization which in its ultimate analysis means nothing. "The stomach of itself, or the heart can no more produce vertigo than they can produce sensations of flashes of light or obsessions of smell. It is generally known and admitted that the light and smell sensations in these instances are produced by irritation or stimulation within the brain of the visual or olfactory apparatus as the case may be. All conscious sensations are cerebral. Headache no matter what it is due to, is nevertheless in the head. In just the same way if a disturbance in any organ of the body is accompanied by vertigo the latter is due to a direct attack on the apparatus capable of producing vertigo—namely, the internal ear or its intracranial distribution." (Jones).

"If for any cause, immediate or remote, there occurs disturbance of the equilibratory ear mechanism there is resulting vertigo."

Vertigo may be caused, or to put it in other words, the ear mechanism may be involved by:—(1) Toxaemia from any organ or part of the body; (2) Cardiovascular disturbance; (3) Ocular disturbance; (4) A localized lesion affecting the intracranial pathways from the ear, and (5) A lesion in the ear itself.

With the above grouping as his fundamental conception the practitioner may now review the history and the examination of his patient.

He will first of all make certain that his patient's complaint is actual giddiness with disturbance of equilibrium. Under the term "vertigo" the public understands very different things. "A momentary fit of weakness, the feel-

ing that it is suddenly black before the eyes, as if the legs were sinking into the floor, or as if they were taken away from the body; all these abnormal sensations generally come under this designation" (Bing). These are not vertigo. Further; staggering or falling is not necessarily vertigo; a tabetic may stagger about without being dizzy.

In all probability the patient has other complaints as well. These should be recorded carefully. The associated complaints of themselves may be sufficient to guide to the correct final diagnosis. The patient is then made to review the story briefly he has given and in doing so to carefully place his symptoms in their proper chronological order.

The patient's major complaint is vertigo. At once it should be tested out. Can he walk in a straight line or does he constantly deviate to one side? A defect of this sort may be undetectable until a patient attempts to walk on tiptoe. Can he stand equally well on either foot? Now test for Romberg's sign. Direct your patient to stand head erect and directed forward, with his feet as near together as he is able to do with steadiness, and, having established his stability in that position with open eyes, tell him to close his eyes. If he sways or tends to fall it is clear that he has been depending on his visual impulses and that without their aid the impulses derived from his legs and trunk were insufficient for the preservation of his equilibrium. If he sways one of two conditions is present. Either the impulses from his internal ears are normal and those from his posterior columns are abnormal, or *vice versa*.

Having determined that your patient sways, next determine which way he would fall. Now repeat the test four more times with the head in each of the following four positions:—(1) Head erect, chin over right shoulder; (2) Head erect, chin over left shoulder; (3) Face directed forward but head tilted toward right shoulder; (4) Face directed forward but head tilted toward left shoulder.

If the direction of falling remains constant there is probably a lesion in the cerebellum. If the direction of falling alters 180° when the position of the head is altered 180° there is probably an affection in one of the semicircular canals.

While vertigo is always accompanied by pronounced disturbances of equilibrium the reverse is not true.

The next step is to examine carefully for nystagmus. With head erect and level the patient is told to look straight ahead at a far distant object. Keeping his eyes on the object he is turned to the left until he is looking at the object out of the right corners of his eyes. He is then turned to the right until he looks at the object out of the left corners of his eyes. Finally he is made to look at an object high above him and at another far below his line of vision. In each of these five positions of the pupils the presence or absence of nystagmus is noted. If nystagmus is present, its speed and amplitude and the direction of the quick component are noted. Nystagmus is always increased in rate when the eyes are turned in the direction of the quick component. If there is nystagmus on looking upward there is probably intracranial mischief. If the quick component of the nystagmus is to the same side no matter which way the eyes are turned there is almost certainly an irritative lesion of one of the semicircular canals.

Finally specially look for involvement of one of the cranial nerves and test the coordination of the patient. You have already tested the coordination of the lower limbs and the eyes, so proceed to examination of the shoulder-girdle, arms, and hands. Such tests may be mentioned as the finger to nose, finger to finger, thumb to finger, opening and closing the hands, and alternate supination and pronation. Note whether the patient is right or left handed. Finally make the patient touch with outstretched finger an object in front of him; then make him close his eyes, raise his arm above his head, and bring his arm down in an attempt to touch the object with his finger. Repeat with the other arm. The study of the evidence so procured will give an indication as to whether the patient has a unilateral spinal or intracranial lesion, or whether the process is diffuse or whether there is an affection of one internal ear.

Having made these observations, again revert to our grouping of modes of involvement of the ear mechanism, and consider the following suggestions:—

1.—*Thinking of toxaemia.*—If the patient's giddiness has occurred in attacks, carefully

glean the time, duration, periodicity and number of these, and ask if they have been associated with any other constant subjective phenomenon. Ask if the attacks are increasing in severity, if the hearing is affected during the attacks and if both hearing and stability become perfectly normal between attacks. Alcoholism, tobacco, salicylates, ptomaine-poisoning and gastro-intestinal disturbance are most frequent causes of evanescent toxaemic involvement of the ear mechanism. In this connection let me state that "the mere presence of alcohol in the stomach does not produce vertigo, it is only when through the blood stream the alcohol reaches the ears and the brain that the patient becomes dizzy." Headache is usually absent in labyrinthine disturbances unless produced by suppuration or by accompanying systemic disturbances; it is usually present in central lesions.

2.—*Thinking of cardiovascular disturbance.*—Re-examine your notes of the examination of the patient's circulatory system; in particular any evidence you may have of high blood pressure, arteriosclerosis or anaemia. Cross question carefully for the occurrence of faintness or unconsciousness accompanying the attacks of vertigo. Just as in the cerebral ischaemia of shock, faintness and perhaps unconsciousness is caused by the temporarily poor blood supply to the phychic centres, so a poor blood supply to the ear mechanism will cause vertigo. It is quite probable that vertigo may depend upon alterations in blood pressure, hence its occurrence in *arteriosclerosis* and *nephritis* where the blood pressure is increased, and in *Addison's disease, some anaemic states*, and *during convalescence* from *prolonged illness* where the blood pressure is diminished. Attacks of vertigo in *elderly people with atheromatous arteries* or suffering from *chronic nephritis* or *arteriosclerosis* must always be regarded as of serious import since they may be the precursor of cerebral haemorrhage or thrombosis.

All vertigos are aggravated by change of body position, especially from lying down to standing up. This aggravation is more pronounced in the case of vertigo from cerebral anaemia than in a case of vertigo from any other cause. This has been felt at some time in the experience of most of us, especially after a debilitating illness which at the same time required us to remain in bed for some days or weeks.

3.—*Thinking of ocular origin.*—Vertigo is especially likely to occur when there is some lesion of the nerves or muscles leading to diplopia. So many cases of vertigo have been cured by correction of ocular defects that ophthalmologists are prone to consider the eye as the most important organ in the causation of vertigo. The eye, however, is often only a contributing cause of vertigo. The eye is not the organ of balance. If the internal ear is destroyed or only slightly irritated there is immediate vertigo and loss of equilibrium, whereas if an eye is destroyed there is blindness but no vertigo.

In this regard therefore, ask questions regarding affection of eye function such as the presence or absence of diplopia, pain behind the eyes, dimness of vision and especially whether the vertigo diminishes or disappears when the eyes are closed or in the dark. If vertigo disappears when the eyes are closed its cause may be looked for in the eyes. If it is increased when the eyes are closed one of the two other main equilibration avenues is seriously at fault.

In labyrinthine disturbance dimness of vision rarely develops except with a toxic nephritis. The ophthalmoscopic examination of the fundus, the urinarysis, and the blood pressure must be considered in making the diagnosis. In diplopia the lesion is central as this lesion never occurs in purely labyrinthine disturbances.

"In the case of vertigo resulting from a disease of the eye or eye muscles the patient's sensation of vertigo is usually referred to external objects; they seem too near or too distant, inclined toward or away from him to one or the other side, or the floor upon which the patient is standing is inclined in one of those directions" and on account of this the patient misjudges the distances and directions of objects and hence is in danger of making false steps and movements. This ocular form of vertigo is unassociated with nystagmus except in cases of eye muscle paresis during the stage of improvement.

4.—*Thinking of the intracranial pathways from the ear.*—Are there any signs of brain tumor? Enquire especially for concurrent increasing headache and vomiting. Are there progressive dimness of vision or attacks of

diplopia? Optic neuritis should be looked for in every case of vertigo. Variation in distribution of intracranial pressure and hence of local blood supply is the probable cause of the frequent occurrence of vertigo in brain tumor. It is more likely to be present when the growth is subtentorial and especially in tumors of the cerebello-pontine angle. Other causes are fracture through the temporal bone; tertiary syphilis having its location in the brain stem; tuberculous inflammation of the basilar meninges.

5.—*Thinking of a lesion in the ear itself.*—This subject is too large for more than cursory treatment. With all his special knowledge of the pathology and physiology of the ear, the otologist will have great difficulty, if there is an otitis present, in definitely proving that the cause of the vertigo is due to something other than the otitis. We may, however, lay down a few postulates for both general practitioner and aurist.

The essential organ of balance is contained in the most medial of the three parts of the ear—namely the internal ear,—nevertheless, certain lesions of either the external or middle ear are capable of causing vertigo without actual involvement of the internal ear. Thus a plug of wax or a foreign body in the external ear may make a man dizzy, or a process acting through the middle ear in such a manner as to make pressure on the stapes or fenestra rotunda may cause vertigo.

The ears should be examined thoroughly in all cases complaining of vertigo, both by inspection and for hearing, and if there should be found any evidence of past or present ear trouble the patient should be sent to an otologist for a complete ear examination and an opinion as to whether he considers the patient's complaint due to peripheral ear involvement.

Sidney Scott has shown that the vertigo of some aviators was caused by obstruction of the Eustachian tube.

The general practitioner cannot be informed too often that stimulation of the internal ear can produce the following five phenomena:—1st. nystagmus; 2nd. past pointing; 3rd. vertigo; 4th. falling, and 5th. nausea and vomiting. The presence or absence of each of these should be noticed. If the majority of these phenomena be present there is almost certainly organic trouble either in the internal ear or in the brain.

The main rules for the interpretation of nystagmus and past pointing have been given above. If the patient falls to one side, is weaker on that side and commits past pointing errors with the arm of that side, the lesion is probably cerebellar. But if both arms constantly commit errors of past pointing in the same direction as the slow component of the nystagmus, the lesion is probably labyrinthine.

Do not douche a chronic ear that has had a perforation.

If there is no ear lesion and the patient's symptoms and signs correspond with your text book picture of Ménière's disease; do make that diagnosis. True Ménière's disease is extremely rare. Histological proof of its occurrence is almost totally lacking. Ménière's symptom complex, however, is a group of symptoms which frequently occurs, and may be produced by any one of several lesions of the vestibular portion of the eighth nerve.

Now review the mass of evidence secured by your cross-questioning and your examination, and make your tentative diagnosis. Most cases of vertigo will be found to be caused by one of our first two groups of causes. The further treatment of these belongs to the general practitioner alone. If visual defect or ocular paresis has been found the examination and opinion of an eye specialist should be obtained. If there is evidence of involvement of the nervous system send the case to a neurologist. If there are signs or symptoms of past or present ear trouble, even if you can almost certainly ascribe the cause of vertigo to something else, by all means have a careful functional examination made of the ear by an ear specialist. Procedure along the lines indicated will make for more rational and more accurate practice of medicine.

SOME ASPECTS OF NASAL ACCESSORY SINUS DISEASE*

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INFLAMMATION of the paranasal sinuses is a very widespread condition, in fact one of the commonest with which we as rhinologists have to deal. My impression is that it is very much more prevalent on this continent than in Great Britain or Europe. It is of interest not only to the rhinologist, but also to the physician, as it is frequently to him that these patients first go on account of headaches, anaemia, or some other symptom which has apparently no relation to the nose. These conditions, on account of variations in anatomical structure, type of infecting organism, and resistance of the patient, as well as the proximity of important nerves and other organs, give rise to diversified clinical pictures. An attempt to discuss the whole subject in one meeting would be out of the question. I will therefore confine my remarks to the symptoms and diagnosis more particularly of the latent forms, based on personal observations of verified cases in the last few years. All doubtful cases have been excluded except where specifically mentioned.

Taking the sinuses as a whole, inflammatory diseases can be roughly subdivided into four groups: (1) Acute catarrh; (2) acute suppuration; (3) chronic catarrh; (4) chronic suppuration.

Acute catarrh of the antrum is generally part of an acute coryza. The lining is swollen, red and secreting copiously. There may be a feeling of tightness in the face, or even pain. That this is due principally to occlusion of the ostium by swollen mucosa is shown by the fact that it is relieved by shrinking the tissues in the middle meatus.

Acute suppuration of the antrum is a further stage of the catarrhal condition. The normal drainage by ciliary action is in abeyance and the antrum becomes filled with muco-pus. In most cases there is a throbbing pain in the cheek of the affected side. The teeth may be tender and there may be lacrimation. In fourteen cases of acute suppuration, pain was felt in the cheek in ten. In three it was felt in the region of the eyebrow and not in the cheek, and in four, it was felt both in the cheek and frontal region. In one there was no pain at all. There is usually profuse discharge of pus into the nose and throat on the affected side. Pain and unilateral purulent discharge give a clear indication for exploring the antrum.

In *chronic catarrh* of the antrum the mucous membrane is thick and juicy with a tendency to polypus formation. In some cases the whole antrum is filled with a polypoid mass and this may protrude through the ostium into the nose and even hang down into the naso-pharynx forming the choanal or naso-antral polypus. In the present series there was no case of definite single naso-antral polypus, though there was one case of pendulous polyp in the nasopharynx on one side in which I severed the attachment in the middle meatus with scissors. I was unable to determine without puncturing whether the antrum was filled with the polyp or not.

Chronic catarrhal or hyperplastic disease merges insensibly into the *chronic purulent antrum* with hyperplastic changes and it is very difficult to differentiate clearly between them. Hirsch[1] states that proof puncture in the catarrhal form does not necessarily reveal the condition. He had had negative punctures in sixteen cases of nasal polypi in which the antrum lining was found to be polypoid. I had two cases in which I subsequently found the antra full of polypi in which puncture was negative. It is quite possible that some others may have been overlooked, particularly if the condition was bilateral. Illumination does not always show them up. When the exploratory needle is definitely in the antrum and yet the fluid will not wash through it is highly probable that we are dealing with such a case.

Chronic purulent antrum disease can be roughly subdivided into the hyperplastic or polypoid, and the latent forms. In the case

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of the former one of the most marked symptoms is nasal obstruction, which is usually absent in the latter. In my series there were thirty cases of chronic antral suppuration with six cases of antrum, ethmoid, and frontal suppuration combined. In ten of these thirty-six the antrum was found at operation to be full of polypi. If one may draw any conclusions from such small numbers, it is evident that a history of recurrent nasal polypi should lead one to investigate the condition of the antrum. I am unable to state in what proportion of cases of nasal polypi the antra are the seat of disease, but nasal polypi were present in sixteen of these verified cases, and I imagine that the real percentage of antrum disease would be something like 90% of all cases of nasal polypi.

Chronic Latent Antral Suppuration.—This form may be present for years without causing any symptoms definite enough to bring the patient to a rhinologist for treatment. Local pain is generally absent and the patient may merely have noticed phlegm in the throat, and perhaps an occasional bad taste in the mouth. A history of bronchitis is very common, and in fact a cough or hoarseness is frequently the symptom for which the patient seeks advice. Such cases are every now and then being referred by the internist, whom they have consulted regarding their lungs. There is a remarkable resemblance between the clinical pictures of chronic latent antrum suppuration and active pulmonary tuberculosis. In both there may be cough, morning sputum, which is green and nummular, wasting, slight evening rise in temperature on exertion, and perhaps physical signs in the chest due to the accompanying bronchitis. In patients in whom there is a chronic catarrhal process of the whole respiratory tract it is axiomatic to look for the cause at the upper end. On looking over my cases I find that nineteen out of the thirty-six gave as one of their main complaints dropping of phlegm in the throat, or cough. In a number of these a history of nasal discharge was only elicited by careful cross-questioning. In one case, a child of eleven, there was a history of constant cough since whooping cough at the age of two. The sputum was copious enough to lead to the diagnosis of bronchiectasis. Tonsils and adenoids had been removed a year previously without benefit; she was referred by the paediatrist who had noticed that she had a nasal discharge. Both middle turbinates were polypoid and both antra contained very thick, creamy pus. A large opening was made intranasally, and the polyps were removed. Some months later the cough had gone and the nose was nearly clean.

A fair quota of patients come in order to have their tonsils removed, as they attribute their discharge to them. Others have had their tonsils removed without any effect on the discharge. One patient had had tonsils and adenoids removed and a submucous resection of the septum, and it turned out that she had a double antrum and ethmoid suppuration. Operation showed both antra full of pus and polypi, with the ethmoids in a similar condition.

With regard to the general effects of infections of the accessory sinuses, I have been struck with the rarity of the train of symptoms usually associated with focal infection, such as rheumatism, neuritis, endocarditis, etc. Every single case was thin, however, and some were even emaciated. In only two of the chronic antrum cases was there a history of rheumatism. One of these patients had pains in the limbs, the other had had acute articular rheumatism some years previously associated with recurring tonsillitis, for which her tonsils had been removed. There had been no rheumatism since then. None had valvular heart lesions that I know of.

Nervous symptoms were, on the contrary, very common. Neurasthenia, debility, extreme nervousness, emotionalism, etc. were commonly noted. Some of these were extreme examples. One man who had had a pain in his head for twenty years was a nervous wreck. He was extremely self-conscious and was afraid to meet people, and had been living more or less as a hermit. Another man had had a pain in his temple for a year and was very melancholic. Some months after his antrum had healed he went out of his mind and had to be sent to an institution, but subsequently recovered. One very interesting case developed a toxic goitre. I had seen her on account of nasal polypi about three years ago, but at that time she would not have them touched as she was very nervous. I saw her again two years later, and in the interval she had developed a severe toxic goitre. Her nose was completely blocked with

polypi on both sides. Both antra and both frontals were dull on illumination. She was too nervous to have anything done with local anaesthesia, so the nose was cleared under general anaesthesia and pus washed out of the antra. A large intranasal opening was made. There was a remarkable improvement within the next few days, the goitre decreasing visibly in size and the pulse rate and temperature dropping to normal. She improved steadily, and the husband reported a few months ago that the goitre could not be noticed at all and that she had gained 56 lb. in weight and felt well. This case is remarkable as showing that there is in certain instances a close relationship between the sinus disease and the nervous or goitrous states.

The above were three severe cases associated with general nervous disturbances but there were many others of a lesser degree. There was one case with asthma and chorea in a boy of twelve. The asthma disappeared immediately after removal of tonsils and adenoids, but recurred some weeks later. A little later pus was discovered in the left antrum which was then drained, with subsequent improvement in the chorea and asthma. He was free from these for about a year, but a few days ago I heard that he had had a recurrence of the asthma following a surfeit of strawberries. There was also a small polyp on the left side.

Pain.—I need only say a few words about the pain in acute inflammation of the nasal sinuses. Acute frontal sinusitis causes pain which is very characteristic in type. It commences as a rule three days to a week from the beginning of a cold in the head. In some cases, however, it is as late as two weeks. In the milder cases and in those of medium severity the pain comes on daily soon after getting up, and reaches its maximum intensity in the late forenoon and early afternoon, generally ceasing rather suddenly in the late afternoon. In the more severe cases it lasts well into the night but rarely interferes with sleep. The pain is usually a dull ache felt in the region of the eyebrow with tenderness on pressure on the front wall and floor of the sinus; the pain is greatly aggravated by stooping forwards. The majority of acute frontal sinusitis cases last about three weeks before clearing up.

Acute inflammation of the antrum is generally accompanied by pain, though not always. It is felt in the cheek as a rule and is throbbing in character. However, in three of the acute cases under review the pain was referred to the root of the nose and over the eye without any discoverable sign of frontal sinus involvement.

In chronic antrum suppuration pain was one of the predominant symptoms in fifteen out of thirty cases in which there was no accompanying frontal sinusitis. In only two of these was it felt in the cheek, and in both of these there was an exacerbation with some obstruction of the ostium through polypoid lining so that the pus was under pressure. In the majority of the others pain was manifested in the form of migrainous headaches on the affected side, often with its maximum intensity in the occipital region. Several cases had severe neuralgic pain. One had suffered from a severe pain in the temple of the affected side for over a year and had become quite unfit for his work as a delivery man. After operation the pain ceased, but left numbness which also went after a time. Two cases had pain in the mastoid and buzzing in the ear which disappeared after puncture and lavage of the antrum.

There were eleven cases of combined chronic antrum, frontal sinus, and ethmoidal suppuration, and of these, eight had pain as a heading symptom. One case of double pansinusitis had had pain in the eyeballs and in the nape of the neck for over twenty years. He was a marked psychoneurotic and in fact on the borderline of melancholia. The pain in the eyes disappeared as soon as the frontal ducts were opened and the antrum washed out. The occipital pain has recurred at intervals but not so severely. His frontal sinuses and antra are not yet healed and his sphenoidal sinuses still require attention.

One case of chronic antrum suppuration with old sphenoidal sinusitis was very interesting in that there was a history of old-standing severe headaches felt in the angle of the eye on the affected side, and also over the whole posterior half of the head. After the antrum was cleared out the pain round the eye and most of the occipital headaches ceased, but on two occasions there were recurrences of the occipital

pain due to a transitory recrudescence of the sphenoidal sinusitis.

Diagnosis.—A history of recurring colds, or chronic nasal catarrh with dropping in the throat for which no obvious cause is seen should at once raise a suspicion of latent sinusitis. Again, all cases of persistent or recurring headaches, particularly if unilateral, should be investigated with this in mind. If nothing abnormal is seen in the nose and sinusitis is suspected, it is advisable to shrink the mucous membrane thoroughly. Some pus or sessile polyps may then be seen under or above the middle turbinate. I have found the nasopharyngoscope of great value, more especially in investigating the regions of the posterior ethmoid and sphenoid. Suction combined with the use of this instrument is of the greatest value here as this is where x-rays and transillumination rarely help much.

It has been repeatedly affirmed that transillumination is valueless or nearly so. My experience is that within its limitations it is quite useful. So much so that I never remove tonsils and adenoids or do a submucous resection in adults without first transilluminating the antra and frontals. In many cases it has given me a hint of antral disease which would otherwise have remained unsuspected. It is of course, not infallible, as I have had several cases where the antra illuminated well although thick pus was washed out a few minutes later. Conversely, dark antra do not always indicate pus. However, if one antrum is dull and the other is clear, further investigation is required. Transillumination is also useful in cases where the duration of the condition is indefinite in giving us an idea of the state of the lining membrane by comparing the degree of illumination before and after washing out the cavity. It also gives a gradually clearer illumination as an inflammation is subsiding. In the case of the frontal sinuses we can sometimes make a fairly good guess as to whether a painful sinus is full of pus or merely air, according to the degree of illumination. A large air-filled cavity with a blocked ostium may cause much more severe pain than a cavity full of pus with a slight leakage. When the cavities cannot be illuminated at all it is sometimes very difficult to tell wthout an x-ray picture whether the sinuses are present and full of pus or only too small to show up. In young children transillumination is so indefinite as to be practically useless.

Suction as an aid to diagnosis is very useful and is easily performed. To get the best results and to avoid injury, the nose must first be thoroughly shrunk. It should be applied for only a second or two at a time and repeated several times. To test the antrum it is necessary to turn the head round towards the affected side and then bend the head forwards. As already mentioned it is particularly useful in detecting posterior cell suppuration.

Puncture and washing out of pus is the final proof of antrum suppuration. However, a negative result does not always mean that the antrum is healthy, as the pus, if very mucoid, may have been discharged in a single lump and have left the cavity clean for the time being. If the antrum is polypoid, a negative result may be obtained either through the fluid not going through at all or returning clear. In some of these cases the whole antrum is filled with a single polyp and there is very little secretion.

If I may digress a little here I would like to say a few words about exploratory puncture of the antrum. This is usually simple and easily performed without much discomfort to the patient. However, now and again accidents happen, some more or less trivial, others of the greatest gravity. Among the less serious accidents is one where the point of the trocar perforates the anterior wall of the antrum, causing emphysema or infection of the cheek. Another unwished for occurrence is that the needle traverses the antrum and perforates the posterior wall into the pterygoid fossa. This has happened to me twice, but fortunately with no worse consequences than a temporary swelling of the face, and incidentally the loss of the patient. The point of the exploring needle may enter the orbit with possibly serious results. A good many years ago when washing out the antrum through the middle meatus with a Watson-Williams curved needle I got into the orbit but luckily no harm resulted.

A number of cases of sudden collapse during antrum lavage or perflation have been recorded. Brown Kelly[2] in 1914 collected 9 fatal cases and in most of his and others subsequently recorded the cause of death appeared

to be air embolism. In the majority, collapse occurred during, or immediately after, blowing air into the antrum. In one case autopsy showed that the lining membrane had evidently become separated from the bone and air had evidently got into the bone vessels. In others air entered the veins of the pterygoid plexus. Schlittler[3] discussing such cases points out that there are numerous large vessels in the median wall of the antrum at the level of the inferior meatus as well as a plexus in the lacrimal canal. He concludes that embolism is due not necessarily to the blowing of air through, but rather to the use of sharp instruments, and especially through the wall of the inferior meatus. He alvises always to use blunt instruments through the middle meatus. Scheibe[4] agrees with an observation by Killian that washing pus out of the antrum for the first time is generally followed by a rise in temperature. He had had no embolism cases but several of erysipelas pyaemia, and one death from general sepsis.

From all this it is evident that one must be cautious in blowing air into the antrum. Never do it before washing through with fluid, and never use any force. If it won't wash through there are several possibilities, (1) that the needle is not in the cavity, (2) that the ostium is blocked, (3) that the needle is in the cavity but embedded in thick mucosa, and (4) the needle may be in a dental cyst. In the second case only, *i.e.* where the ostium is blocked, and possibly also in the case of a dental cyst, will the forcing of fluid perhaps do no harm; in the others, instant collapse and possibly death may result.

Lastly, a word regarding the use of the x-rays. For the diagnosis of pus in the antrum it is of very little value, as at best the picture merely means that there is possibly pus there, while certainty can be attained in a few minutes in the office with the needle. However, when puncture is negative it may give an indication of polypus formation in the antrum. It is in frontal sinus work that it is most useful to indicate the size and shape of the cavities, and to inform us if a sinus which could not be illuminated is present at all, or when present, if it shows signs of disease.

In the diagnosis of posterior ethmoidal and sphenoidal conditions radiography is on the whole not very helpful. The only method which gives moderately clear pictures of that region is by projecting the rays through the crown of the head on to a film in the mouth, or from the crown through the open mouth, or under the chin.

Conclusions.—Latent paranasal sinus disease is a very widespread and common condition, and is liable to be overlooked.

No one diagnostic method can be absolutely relied upon. Even puncture and lavage has its fallacies, and a correct diagnosis in difficult cases can be arrived at only by correlating the data and carefully weighing all the facts.

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Chronic Gallbladder Disease in the Young Adult.—Fifty-seven cases of chronic gallbladder disease in young adults, operated on in the early stages of the disease,, with no mortality, form the basis of the paper by Arthur T. Mann and Hugh S. Willson, Minneapolis. All these patients have improved, and most of them have lost their symptoms. The authors feel that these studies are a clinical demonstration of the associated inflammation of the gallbladder and the liver, by way of the lymphatics. In every case both the gallbladder and the liver showed changes of the chronic inflammatory type. In the gallbladder, the deeper layers showed more changes than the mucous membranes. In the liver, the changes were in the connective tissue of the perilobular spaces, with subsequent atrophy of the enclosed lobules. It seems to them, also, that the whole series of cases supports the infectious origin of chronic cholecystitis. All of the series (fifty-seven patients) were treated with double ligation of the cystic duct and with primary closure of the abdomen, without any mortality resulting. However, this procedure is not strongly advocated.—*Jour. Am. Med. Ass.*, Sept. 27, 1924.

THYROID PREPARATIONS IN THE TREATMENT OF THE STOKES-ADAMS' SYNDROME

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THE cerebral phenomena resulting from the diminution or arrest of the circulation of the brain, associated with very slow contractions of the ventricles, constitute the Stokes-Adams' syndrome. The phenomena may vary from transient periods of giddiness, to complete loss of consciousness and, when cerebral anaemia is prolonged, to epileptiform convulsions or death. This syndrome usually occurs when there is complete heart block, although identical cerebral manifestations occur with other conditions when the rate of the ventricles is slow, or the expulsion of blood with each contraction of the left ventricle is diminished. Certain cases of cardiosclerosis without heart block are accompanied by Stokes-Adams' seizures, and also long periods of complete cardiac standstill with sino-auricular block invariably resulting from stimulation of the vagi.

In 1916 Blackford and Willius reported four cases of complete heart block with Stokes-Adams' seizures in which the patients were benefited by the administration of thyroxin (known then as alpha iodin).[7] The beneficial effect of thyroxin was attributed to a quickening of the idioventricular rate. As the result of further study and the accumulation of more detailed data on a much larger group of cases, the previous conclusions are no longer tenable. Aub and Stern, in 1918, reported a case of complete heart block in which thyroid extract had been given. They found acceleration of the rate of the auricles, but no change in the frequency of the ventricular contractions. A careful analysis of a large group of cases of complete heart block, in which thyroxin or dessicated thyroid extract was given, failed to show any appreciable acceleration of ventricular rate, yet invariably the Stokes-Adams' seizures disappeared or at least were less severe, and less frequent. It was evident, therefore, that other factors were instrumental in the alleviation of the periods of cerebral anaemia. The explanation of the factors responsible for the clinical improvement in patients having the Stokes-Adams' syndrome is found in the recent advances made in the physiology of the thyroid.

Kendall, in 1914, isolated thyroxin as a pure chemical compound from the thyroid, in 1917 he determined its empirical formula, and in 1918 proved its structural formula. Plummer, in 1917, brought forth the concept that thyroxin is active in nearly all, or all, of the cells of the body, and that it is a catalyst increasing the rate of formation of a quantum of potential energy available for transformation on excitation of the cells.

Benedict, Lusk, Dubois, Means, Boothby, and their associates, by their calorimetric studies, have aided materially in crystallizing knowledge pertaining to the physiology of the thyroid. It has been shown that the basal metabolic rate is constantly elevated beyond normal limits in exophthalmic goitre and in adenomatous goitre with hyperthyroidism. The basal metabolic rate in a thyroidless adult man is from 30 to 42 per cent below the average normal. Plummer[16,17] has pointed out that the basal metabolic rate may vary from 42 per cent below normal average to at least 100 per cent above, depending on the thyroxin content of the tissues. He has further shown that the human body contains about 14 mg. of thyroxin, and that in normal persons the amount varies within relatively narrow limits. An increase or decrease of approximately 1 mg. in the thyroxin content of the body causes a corresponding alteration of 2.8 per cent in the basal metabolic rate.

Studies of the cardiovascular reactions in exophthalmic goitre and in adenomatous goitre with hyperthyroidism throw light on the rationale of thyroid medication for Stokes-Adams' disease. Plummer,[15] and recently Willius and Boothby, have shown that definite physiological cardiovascular reactions accom-

pany the elevation of the basal metabolic rate in both thyroid disorders.

If a reduction occurs in the cross section of the peripheral arteriocapillary system in relation to the rate of blood flow from a more or less transient increased resistance of the arteriocapillary muscles, or from a more permanent sclerotic or anatomic status, both the systolic and diastolic blood pressure will be proportionately elevated. A diastolic pressure elevated beyond the normal probably indicates that the arterioles are not relaxed to the normal degree during diastole, and is therefore, evidence of an increased resistance in the peripheral arteriocapillary system. Furthermore, if there is no increase in the average size of the peripheral cross section when the circulation rate is increased, a distinct rise in the systolic pressure occurs with only a slight or moderate rise in the diastolic pressure. When a compensatory increase in the average size of the peripheral cross section occurs, the systolic pressure will be elevated to a lesser degree, and the diastolic pressure will remain constant or be somewhat lowered, depending on the degree of alteration of the varying factors.

The increased metabolism associated with both exophthalmic goitre and adenomatous goitre with hyperthyroidism, indicates an increased conveyance of metabolites to and from the cells, necessitating an increase in the circulation rate. The resulting rapid pulse rate and the increased pulse pressure are a physiological reaction of the cariodvascular system to effect this increased rate of circulation, and if long continued, may finally result in cardiac decompensation.

TABLE I.

Average blood pressure observations in 377 cases of exophthalmic goitre and adenomatous goitre with hyperthyroidism.

	Exophthalmic goitre	*Adenomatous goitre with hyperthyroidism*
Systolic	147	153
Diastolic	73	83
Pulse pressure	74	70
Pulse rate	123	110

These figures represent averages of several determinations in many cases, and are, therefore, of much greater significance than if they were single observations on individual patients.

In exophthalmic goitre (Table 1) an elevation of the systolic pressure occurs, while the diastolic pressure often remains normal; more often it is slightly lowered; rarely is it elevated.[6] The pulse pressure is increased, but in the absence of increased diastolic pressure, there is no increase in peripheral resistance, but rather a relatively dilated periphery to allow the increased rate of circulation with the least effort on the part of the heart. In adenomatous goitre with hyperthyroidism, the systolic pressure is considerably elevated, and often to a much greater degree than is exophthalmic goitre. There is, however, on the average an elevation in the diastolic pressure, thus differing from the usual behaviour of this factor in exophthalmic goitre. In some cases, this is rather pronounced, and indicates a relative decrease in the average peripheral cross section. The pulse pressure, likewise, is greater than normal. The pulse pressure in conjunction with the pulse rate is quite a reliable indication of the circulation rate and therefore of the metabolic rate, provided other factors, such as increased peripheral resistance resulting in a marked elevation of the diastolic pressure, do not exist. This observation has also been emphasized by Read.

It is also necessary to appreciate the cardiovascular reactions attending bradycardia. In a previous publication[19] I discussed these reactions according to degrees of ventricular slowing. The cases were studied according to ranges of ventricular rates and grouped with reference to permanent and transient bradycardia. Table II. shows the blood pressure observations in 183 cases of chronic bradycardia. It is evident that with a permanent slowing of the pulse rate other compensatory factors must be called into play to meet the circulatory requirements of the organism. In both groups of bradycardia associated with organic cardiac disease, a distinct increase in the pulse pressure is apparent (71 and 62), and in both instances this is accomplished by an elevation of the systolic pressure apparently proportionate to the degree of cardiac slowing. The diastolic pressure does not vary materially, yet is elevated slightly, but definitely, above the average normal.

TABLE II.

Average blood pressure observations in 183 cases of chronic bradycardia associated with organic cardiac disease without heart block.

Pulse rate range	*Systolic*	*Diastolic*	*Pulse pressure*	*Pulse rate*
40 to 49	151	80	71	47
50 to 59	144	82	62	55

In view of the fact that the heart does not increase its rate of contraction, an adequate circulation rate must be maintained by other circulatory variants. According to the concept presented in the discussion of the cardiovascular reactions attending exophthalmic and adenomatous goitre with hyperthyroidism, it was shown that the increased pressure was indicative of an increased circulation rate affected by acceleration of heart rate and increased volume outflow for each beat. The blood pressure studies in this group, according to the same line of reasoning, indicate that the circulation rate is, in part, maintained by increasing volume output for each beat.

TABLE III.

Average blood pressure observations in fifty-eight cases of transient bradycardia unassociated with organic cardiac disease and presumably vagal in origin.

Pulse rate range	*Systolic*	*Diastolic*	*Pulse pressure*	*Pulse rate*
40 to 49	113	73	40	46
50 to 59	121	76	45	55

Confirmatory contrasting evidence is found in Table III. in which comparable ranges of bradycardia are tabulated, but in which the cardiac slowing is transient and unassociated with organic cardiac disease, and compensatory circulatory reactions on the part of the body are not required. It was found that the pulse pressure in both ranges was normal or even slightly diminished, and the diminution was effected by a decrease in the systolic pressure. There was no evidence from any standpoint that an attempt at increasing the rate of circulation was being made.

TABLE IV.

Average blood pressure observations in thirty cases of complete heart block.

Systolic	*Diastolic*	*Pulse pressure*	*Rate of ventricles*
171	72	99	37

In complete heart block, very marked alterations in the blood-pressure readings are usually observed. The average blood pressure and ventricular rates of thirty cases are recorded in Table IV. The outstanding feature is the enormous increase in the pulse pressure (99) which is entirely effected by the elevation of the systolic pressure (171). In several cases, the systolic pressure was well above 200, yet there is no basis to interpret these readings as indicative of vascular hypertension, as the normal diastolic readings point to a normal, or even a slightly relaxed peripheral arteriocapillary circulation. These blood-pressure readings, furthermore, are not due to aortic regurgitation, as this defect was eliminated by clinical methods. Here again, a compensatory circulatory mechanism must be instrumental to insure a rate of circulation permitting the body to carry on its functions. The circulatory needs are met by a large volume output for each beat. Musser, in 1917, reported two cases of complete heart block with extremely high systolic blood-pressure readings, and presented evidence to show that these high readings were dependent more on the increased mass of blood discharged by the left ventricle, than on the associated cardiac hypertrophy and peripheral sclerosis. The hypertrophy of the left ventricle that is invariably present in complete heart block is in all probability the result of the increased work required of that chamber.

Another factor that may be compensatory in meeting the oxygen needs of the organism, is the oxygen-carrying capacity of the blood. No direct evidence is available to show that the venous oxygen tension of the blood is decreased in pronounced ventricular slowing. Even though such a mechanism occurs, the factors concerned are still largely those dealing with mechanical alterations of the cardiovascular system. Furthermore, when the circulation rate is increased by the elevation of basal metabolism, no evidence exists at this time indicating a marked increase in the oxygen utilization from a unit quantity of blood unless cardiac decompensation has developed.

Mackenzie attributes the phenomena of the Stokes-Adams' syndrome to ventricular stoppage, yet we are led to believe that another mechanism is also instrumental in certain cases. We have observed typical Stokes-Adams' seizures in a group of patients associated with ventricular slowing (40 to 50 beats each minute)without existing heart block. The rate is not affected by atropin. The condition conforms to the clinical type of disease designated as cardiosclerosis when a rather diffuse sclerosis or fibrosis of the myocardium exists. The patients invariably are men in the sixth decade of life or beyond, and have little complaint other than the milder manifestations of the Stokes-Adams' syndrome and slight dyspnoea

on exertion. Definite arteriosclerosis of the peripheral arteries is invariably present. Blood pressure studies frequently show a decreased pulse pressure (30 to 40), effected almost entirely by a lowering of the systolic pressure. Wilson, in a series of essays, discusses the changes of the myocardium affected by the metamorphosis of age. He emphasizes the loss of normal resilience of the myocardium by the advancing fibrotic processes of age. The probable physiological reactions of a myocardium with diminished elasticity and resilience resulting from sclerotic degenerative changes, are very interesting.

Diminished elasticity implies diminished amplitude of contraction favouring underfilling of the ventricles and, therefore, decreased volume outflow. To favour greater filling of the heart, the rate is slowed, thereby increasing diastole. If these events progress without increasing contraction amplitude, it is readily seen that volume outflow may become reduced to the point where cerebral anaemia occurs.

The use of thyroxin or desiccated thyroid extract in the treatment of the Stokes-Adams' syndrome may produce a beneficial effect by increasing the basal metabolic rate which in turn increases the circulation rate. The increased circulation rate is accomplished largely by increasing the volume output of blood for each beat from the left ventricle, and is facilitated by a normal or relatively dilated peripheral arteriocapillary system. Any good thyroid preparation may be used with equal benefit to the patient, provided the potency is known by experience. In most preparations of desiccated thyroid extract one or two grains is equivalent to 1 mg. of thyroxin. The dosage of thyroid may be established empirically and under guidance of the clinical symptoms, but it is far more satisfactory to follow the whole course of the treatment with frequent, accurate basal metabolic rate determinations.

Several basal metabolic rates should be taken to establish the normal average definitely, and the dosage of thyroid must be limited to prevent the basal metabolism from exceeding the upper limits of normal (plus 10 per cent). Experience has taught us that the dosage of thyroxin usually appropriate in these conditions is from 1 to 2 grains of desiccated thyroid extract (0.8 to 1.6 mg. thyroxin daily). If, however, the basal metabolic rate is reduced below the limits of normal before treatment is instituted, larger dosage is obviously necessary. Certain patients do not readily absorb thyroid from the gastro-intestinal tract, and larger dosage is necessary. As an illustration of what may be accomplished by treatment with thyroid the following cases are reported:

CASE I.—(A163350). A young married woman, aged twenty-five years, came to the Mayo Clinic in 1916 complaining of spells of sudden unconsciousness. She had never been pregnant. The only important factor in her previous illnesses was repeated attacks of tonsillitis. Three years previously, she fell and struck her lower back. The pain was very severe for a week and was then relieved by the discharge of a large quantity of pus through the rectum. A week later, she had an attack of tonsillitis, and after a week of illness, she began vomiting repeatedly and had repeated fainting spells. A physician was called who found her pulse to be 28. She made a fairly satisfactory recovery and for a year was in fair health except for dyspnoea on exertion. One morning two years before coming to the Clinic, she fell over suddenly, and remained unconscious for nearly an hour. During this time, she was said to have been very blue and to have had a very slow pulse. Since then she had had repeated sinking spells, with slow pulse, usually brought on by exertion.

Examination revealed the heart to be enlarged to the left, the percussion dullness extending 11.5 cm. to the left of the median sternal line. The rate at the apex was very slow (42) and arrhythmic. A faint blowing systolic murmur was audible at the apex with only slight transmission toward the axilla. The tonsils were moderately enlarged and there was marked evidence of chronic tonsillitis. The systolic blood pressure was 158 and the diastolic 78. An electrocardiogram confirmed the clinical diagnosis of complete heart block.

Thyroxin, 0.8 mg. was administered daily by mouth, and after five days the auricular rate rose from 92 to 120, and after nine days, had attained 180 each minute. The ventricular rate ranged from 40 to 48, showing no acceleration. The patient then left the Clinic. Eight months after the beginning of the treatment, she wrote: "My health is fine and I am gaining every day. I can do as much work as the average woman, and not get very tired either."

Comment.—In this case, there was complete cessation of the Stokes-Adams' syndrome. The patient was observed on numerous occasions during the succeeding four years, and while she was taking thyroxin, remained free from the attacks of unconsciousness, although the complete heart block persisted. On several occasions when the supply of thyroxin was exhausted and some delay occurred in securing more, the attacks recurred temporarily. The patient was last heard from four weeks ago and reported her condition as excellent. Three years ago, she passed successfully through a normal labour.

CASE II.—(A158034). A man, aged fifty-one years, came to the Mayo Clinic in 1918, complaining of faint-

ing spells. He had felt well up to two months before, except for slight shortness of breath on exertion during the preceding year. His physician had noticed that the pulse rate was slow and the blood pressure low. He had had occasional attacks of tonsillitis, and had been treated for episcleritis in 1916.

Examination revealed the heart to be slightly enlarged to the left. No murmurs or arrhythmia were noted, but the heart rate was slow (46 each minute). There was a moderate degree of peripheral arteriosclerosis. The systolic blood pressure was 110 and the diastolic 64. The electrocardiogram revealed a rate of 47, and sinus bradycardia. A diagnosis was made of cardiosclerosis with Stokes-Adams' syndrome.

Atropin was administered to the point of physiological effect without heart rate acceleration, or alleviation of the fainting spells. The patient was given thyroxin, 0.8 mg. daily, and was entirely relieved of the cerebral manifestations. He has been under observation intermittently since, and has remained free from symptoms. He was last observed in January, 1924.

Comment.—It is not advisable to administer thyroid extract if cardiac decompensation exists. It is evident that the increased work cast on the heart by the elevation of the metabolic level would tend to favour the development of myocardial failure.

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Against White Bread.—Recent discussions in the lay press of England on the increase of cancer have again caused an attack to be made on the use of white bread, which is denounced as one of the causes of the increase because it is deprived of important components. Want of these in the food, it is held, lowers the resistance of the system to disease and also induces intestinal stasis, which, according to Arbuthnot Lane, is a great cause of cancer.

The whiter your bread,
The sooner you're dead.

With these lines, the *Daily Mail* begins an attack on the use of white bread which recalls its campaign of a few years ago. It also quotes Sir Harry Baldwin, surgeon dentist to the king, who says: "It is eminently desirable that the great stable article of diet should be of wholesome and nutritious quality. The fact is that the bread and flour supplied to our people has been deprived of all its vitamins and most of its proteins and valuable mineral salts. This is why we have so largely a 'C3' population."

"Knowledge and wisdom, far from being one,
Have oft times no connexion, Knowledge dwells
In heads replete with thoughts of other men;
Wisdom in minds attentive to their own.
Knowledge is proud that he has learned so much;
Wisdom is humble that he knows no more."
—Cowper

X-RAY TECHNIQUE IN EXAMINATION OF THE CHEST*

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WITH the perfection of apparatus, particularly those improvements made possible by the advent of the Coolidge tube, and finally by the addition of fast intensifying screens and super-speed films, the improvement which has taken place in x-ray plates of the chest has been most striking. One of the most pleasing features in the present conference to one who is interested especially in x-ray matters is the uniformly high average of quality in the plates presented and this is in striking contrast to any similar conference of even a few years ago. It is an evidence of the improvements in apparatus but equally an evidence that general use is being made of the information available on the subject.

The criteria upon which good chest plates should be judged are simple and few, but in the writer's opinion are absolutely essential, if plates of a proper degree of excellence are to be obtained. With the thought in mind that further improvements are possible if these few points are critically reviewed at the present time, the following considerations are presented.

The Photographic Material

A series of tests were made of three of the standard makes of glass plates such as most of us were using a few years ago, and three of the best known films available at the present time, and an effort was made to secure the best possible quality of exposure for each.

There was no doubt in the minds of several of us who examined all the exposures that the films were much superior to the glass plates. Since films also present a number of other very obvious advantages our first conclusion is that glass plates should be generally discarded and films substituted.

The choice between the various films available is determined in favour of that film which will provide the necessary photographic brilliance with the required speed. In the paragraph referring to the time factor it will be pointed out that sufficient speed is just as essential as any other single detail and a slow film would require to show a degree of added excellence which is not at present apparent before it would be the equal of the super-speed film at present in use.

Our second conclusion therefore was that we obtained the best results by using super-speed film and it is accordingly recommended for the present or until a film is developed having qualities or advantages not possessed by this film.

Intensifying Screens

There is such a wide variety of screens available that no attempt was made to test them all. So long as the screen is fast, free from all grain and free from any considerable "lag" it will prove satisfactory, and the consideration of chief importance here would seem to be the care of the screen in order to keep it free from dust and in other ways to keep it clean so as to prolong its useful life. We were convinced that a celluloid (Kodaloid) covering over the face of the screen was undesirable for chest work although this objection does not apply in any other part of the body. The covering slightly reduces the speed of the screen but the chief objection lies in the fact that the detail is less, the bronchial tree markings enlarged and exaggerated, and the fine lines generally appear coarse or hazy as compared with films made with bare screens.

Our conclusion regarding screens was that the best quality double screen should be used. It is essential to have a fine surface entirely free from grain and in our opinion to have a bare screen without any protective covering. Questions of economy may outweigh this latter in the opinion of some since there is no doubt that the cover does prolong the life of the

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screen. When any screen becomes soiled, pitted, or "grained" by embedded dust particles it should be discarded for chest work and used for some other type of radiography in which the finest detail is not so essential.

Contact

Apart from the good quality of the screen itself there is no other single detail of more importance that that of securing perfect contact between screens over the entire surface of the film. Very often the "hazy" area described on x-ray films is due only to imperfect contact. It is an element of possible error which should be avoided. The means of detecting this lack of contact is probably known to all but will be repeated. A piece of wire screening of half-inch mesh and about gauge 20 wire is laid upon the surface of the cassette, an exposure made and the film developed in the usual way. If the contact is correct each wire of the entire piece will appear on the film as a sharply defined line, but wherever the contact was insufficient the lines will be hazy, indistinct or absent altogether if the fault is a bad one. Such a screen should be reinforced with packing in such a manner as to secure perfect, even contact over the whole surface of the film. We have found for this purpose that English broadcloth overcoating is superior to felt. It is thick, elastic, contains no lumps, and if of the proper quality, contains practically no loose hairs.

Pneumatic contact may be obtained either by inflating a rubber bag within the cassette or by loading the screens and film inside a rubber bag forming part of a suitable cassette and exhausting the bag by an exhaust pump, thus securing a vacuum pressure. This latter method is ideal so far as contact is concerned but for obvious reasons difficult to handle in the average busy x-ray department.

Position of The Patient

For the vast majority of cases the best position of the patient is standing or sitting facing the plate. It is not denied that equally satisfactory plates may be obtained with the patient lying face downward, but in cases of lung abscess, tuberculous cavity, pleural effusion, etc. entirely erroneous conclusions may be drawn as to the size of the cavity or effusion if the patient is in the horizontal position. Plates made with the patient lying on the back are usually entirely unsatisfactory and this position should be reserved for patients who are too ill to sit or stand.

In either the standing or sitting posture some form of fixation apparatus is a great advantage and since it is not difficult to improvise is recommended in all cases, even if it is not a part of the regular equipment.

The position of the patient's arms is important. In order to ensure the lung fields being free from shadows due to the scapulae, the patient is asked to place the dorsal surfaces of both hands against the lumbar portion of the trunk and then rotate both shoulders forward as far as possible. In the ideal case this will bring both shoulders and elbows into contact with the plate and the scapulae will swing completely out of the field. It also has the advantage of being a comparatively easy position for the average person to maintain.

Stage of Respiration

If the average patient is asked to take a full inspiration and hold it, he (or particularly she) will almost certainly take a full breath and then let it slowly out with practically no appreciable period during which the lung is absolutely still. The same observation is even more true of a full expiration since this is a more difficult stage to maintain.

If, instead of either, the patient is instructed to take an *easy* breath and hold it and if this is rehearsed two or three times during which the operator observes carefully to detect the slightest movement, it is easily possible in all except a very few individuals to secure complete immobilization of the lung so far as respiration is concerned. The movement of the left border of the heart, part of which is communicated to the adjoining portion of the left lung, can only be controlled by the speed of the exposure and will be discussed presently.

It is therefore believed that for all routine exposures the *easy* stage of respiration be selected and full inspiration on the one hand or full expiration on the other be reserved for special studies in which these stages are particularly desired.

Factors Affecting the Exposure

Apart from the photographic qualities of the final film we believe three points are of cardinal importance. There may be others, but if these three are fully attained the results will, we believe, be satisfactory to most.

(1) The left border of the heart should show no movement but appear as a sharp, still, outline.

(2) The linear markings of the bronchial trunks should be sharply defined and visible to the extreme periphery *in the bases*. In the average good plate the lung is still in the apices, but there is nearly always some evidence of movement in the bases. In the perfect plate the entire lung is dead still and the detail increased accordingly. The importance of this cannot be over emphasized. Many bronchiectatic cavities are not now demonstrated because of failure to secure complete immobilization of the lung, (remembering that movement in the lung is both respiratory and cardiac).

(3) The apices should be well opened up and appear larger than they actually are in order to avoid the conflicting shadow of the clavicle and first rib appearing right across this important area of lung.

The speed of exposure controls the first two, while the position of the tube is responsible for the last.

Position of Tube

The tube is placed in position behind the patient at a distance of thirty-two inches and centred for the first exposure over the third dorsal vertebra. Following the first exposure the tube is dropped vertically while the patient holds his breath and the second exposure made. This will bring the second centre about the sixth dorsal vertebra.

Plates made at a greater distance than thirty-two inches have been recommended and have certain advantages, but in the writer's opinion these advantages do not compensate for the loss due to greatly prolonged exposure. One has never seen plates made under such method which can fulfill conditions one and two, and these we regard as of more practical importance than teleradiographic effects in the chest.

The Exposure

It is not the purpose of this article to attempt a discussion of exposure technique apart from the two essential points. The first of these is the time factor. If the movement of the left border of the heart is to be effectively "stopped" the exposure must not be longer than 1/20 second, and should preferably be 1/40 second.

The second point we wish to urge is the actual measurement of the thickness of each patient in order to make possible a uniform technique. Where the exposure is expressed in fractions of a second the thickness of the part must be accurately known. The present writer has described elsewhere a suitable caliper for this purpose in the construction of which a complete exposure-meter has been incorporated. But any simple apparatus will serve the purpose so long as it accurately determines the antero-posterior measurement of the chest.

Given a standard technique and proper apparatus the only unknown factor now remaining is the "density" of the chest tissues which is not in any sense expressed by its thickness in inches. For this reason it is a good preliminary to screen all patients submitted for stereoscopic plates. If fluid, tumours or other unusual densities are present the time of exposure will require to be modified accordingly.

The chief difficulty which will be encountered in very fast exposures with the standard apparatus in use in this country will probably be found in obtaining an accurate timing device which will operate always at the "peak" of the sine wave and never in the "trough." In the latter case not sufficient current would reach the tube to produce a satisfactory plate.

The simplest of the effective means of ensuring the exposure always at the peak is provided by a modification of the standard current "breaker" which can be set to "break" at a given load. For practical purposes this will always happen at the desired stage of the cycle and will provide a sufficiently accurate timing device which can be re-set rapidly enough to ensure two exposures during one breath.

Development of the Films

Having thus far attempted to standardize each procedure we believe the development should also be carried out by the tank system on a strict time and temperature technique rather than by any method of inspection. There is no need to repeat here information which is given with great detail by the manufacturers of the film as to proper dark-room procedure.

It may not be unprofitable, in closing, to remind ourselves that chemicals are the cheapest materials in the whole procedure, and it is poor economy indeed, to attempt to save here at the expense of dull, poor films, which become a lasting reflection upon their maker instead of a constant source of gratification which every piece of really good work should be.

BACTERIOLOGY OF SCARLET FEVER

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THE question of the etiology of scarlet fever remains unsettled. From time to time various workers have brought to our attention new organisms which they believed to have some bearing on the cause of the disease. In the light of more recent studies, these organisms, with the exception of the streptococcus, are not believed to have any significance.

Crooke (1885) demonstrated streptococci in cadavers of scarlet fever victims. Class (1899) described a Gram negative coccus with which he produced exanthemata and acute fever in pigs. It is thought that he was dealing with a streptococcus. Baginsky and Somerfeld (1900) also reported the presence of streptococci. Mallory (1904) suggested protozoan-like bodies as the possible agent. Mallory and Medlar (1916) described a diphtheroid bacillus which they called *Bacillus scarlatinae*. Di Cristina (1923) reported an anaerobic, Gram positive organism from blood and spinal cord of scarlet fever patients. Parker (1922) following an earlier observation of Mallory's discovered in scarlet fever cases, a Gram positive diphtheroid bacillus. With this organism he produced a toxin which was neutralized by an antitoxin.

At present, the most interesting phase in the bacteriology of scarlet fever is the rôle played by the streptococci. Haemolytic streptococci are present constantly in the throat and nasopharynx during the first few days of the disease. In severe cases they may be recovered from the blood. Haemolytic streptococci have also given rise to epidemics of severe sore throat with intense toxic symptoms and, in some instances, a scarlatinaform rash. The origin of such epidemics has been traced to milk infection, the streptococci gaining entrance to the udders of the cows. While there is no definite proof that these epidemics were scarlet fever, the resemblance is very marked, and this coupled with apparently authentic accounts of milk-borne epidemics of true scarlet fever is in favour of their having been scarlet fever.

For some time evidence has been accumulating to establish the fact that the streptococci from scarlet fever fall into one distinct immunological group. Moser and Von Pirquet (1902, 1903) were among the earliest to point this out. Other workers, including Aronson (1903), Neufeld (1903) and Weaver (1904) were unable to confirm this specific serological group. But more recently this grouping has been confirmed by Tunnicliff (1920), Gordon (1921), Bliss (1922) and Dochez (1924). In my own work (1924), scarlet fever streptococci were found to fall into one definite and distinct group by agglutination methods. Following this observation we were able to show that these streptococci disappear from the throat by a gradual and progressive loss of specific antigenic qualities.

Schultz and Charlton (1918) described a

phenomenon which consisted in the blanching of the scarlet fever rash by serum from normal persons or from a patient convalescing from scarlet fever. Six hours after the intradermal injection of 1 cc. of this serum, there appeared a characteristic blanching which remained throughout the duration of the rash. They were of the opinion that this was a property of normal serum, lost during the acute stages of scarlet fever, and regained about the nineteenth day of the disease.

Mair (1923) believes that in this reaction we are dealing with a toxin-antitoxin phenomenon. He is of the opinion that in scarlet fever there is elaborated a toxin similar in certain points to that of diphtheria. The rash and other skin changes, he considers, are due to scarlatinal toxin which has entered into combination with the tissue cells. Among the cells affected, are those concerned in the maintenance of tone in the capillaries. The toxin interferes with the function of these cells and the consequent loss of tone accounts for the erythema and exudative phenomena seen in the scarlatinal rash. The serum injected is supposed to contain an antitoxin capable of dislodging and neutralizing the toxin found in these cells, and so restore them to their normal function.

Experimental scarlet fever in man and animals has never been carried out successfully until recently. Drs. G. F. and G. H. Dick (1921) published their observations in human volunteers and were unable to produce the disease. More recently (1923) (1924), however, they have succeeded in producing scarlet fever in man by swabbing the nasopharyngeal mucous membrane of several volunteers with a culture of haemolytic streptococcus which they isolated from the infected finger of a nurse working with scarlet fever cases. They have obtained a toxic filtrate by growing the scarlatinal streptococcus in media enriched with blood. The toxin, which passes a Berkefeld filter, gives a positive reaction in persons who have not had scarlet fever and a negative reaction in those who have. This toxin, they have shown, is neutralized by the serum of patients convalescing from scarlet fever. The Dicks have reported that they have obtained active immunity in a few cases by the injection of two doses of scarlet fever toxin. They described an antitoxic serum obtained by injecting a horse with scarlet fever toxin. Dochez (1924) also described an antitoxic serum which he had obtained by injecting a horse in a special manner with live cultures of *Streptococcus scarlatinae*; a small amount of liquified agar was injected into the cellular tissue of the neck. When the agar had become solid, live culture of the streptococcus was injected into the centre of the nodule. The toxin produced by the organisms growing in the agar was taken into the circulation and stimulated the production of antitoxic antibody. This antitoxic serum would seem to produce very favourable results in acute cases of scarlet fever, as reported by Burke, Trask and Lynch (1924).

Following the production of a toxic filtrate from cultures of *Streptococcus scarlatinae* the Dicks have evolved a skin test to which has been given their name. This test in addition to assisting in the further study of scarlet fever aims at determining susceptibility or immunity to the disease and in assisting in the diagnosis of doubtful cases. Briefly, the test consists of the intracutaneous injection of 0.1 to 0.2 cc. of 1:1500 to 1:2000 dilutions of scarlet fever toxin produced by growing the specific streptococcus in broth enriched with whole blood. After incubation for five days the culture is treated as in the production of diphtheria toxin. To guard against false positives due to protein substances in the filtrate a control skin test is suggested by Zingher (1924) in which the toxin has been destroyed by heating in a water bath at boiling temperature for one hour. This heating does not affect to any extent, the proteins responsible for the pseudo-reactions, but destroys the scarlet fever toxin.

Four reactions are distinguished by the use of the Dick and control tests corresponding closely to the four reactions seen in the Schick test in diphtheria. A positive reaction appears in from four to six hours, and reaches its maximum in size and intensity within twenty-four hours after the injection. There is a local area of redness varying in size from a five cent to a twenty-five cent piece. It is usually circumscribed but may fade into the surrounding skin. Redness and local induration are variable. Persons reacting positively are considered susceptible to scarlet fever. Negative reactions show no change at the site of inocu-

lation. These reactions are thought to indicate immunity to the disease. Pseudo reactions are of two kinds—the pseudo-negative and pseudo-combined reactions. The negative type shows an equal area of redness at the site of test and control. These persons are thought to be immune to scarlet fever. The positive reactions show a more intense reaction in the test than in the control and are considered to indicate susceptibility to scarlet fever.

Zingher (1924) has made a careful study of the value of the Dick test in normal persons and in active and convalescent cases of scarlet fever. The results show that in the normal population the percentage of susceptible persons by age groups and by social status resembles closely the similar percentage of persons susceptible to diphtheria shown by the Schick test. In the early stage of scarlet fever, a positive reaction was shown in each of 141 patients studied. These reactions rapidly became less strongly positive, and were found to be negative from the seventh to the tenth day of the disease. In a study of the 170 cases during convalescence from scarlet fever, 93% showed a negative Dick reaction. The remaining 7% showed persistently positive reactions.

In a study to determine whether there was an intrauterine transmission of scarlatinal antitoxic antibodies similar to the transmission of diphtheria antitoxin from mother to offspring through the placental circulation, Zingher (1924) has shown that an infant usually retains its immunity up to the fifth or sixth month of life, when it begins to lose it.

Persons susceptible to scarlet fever may be actively immunized by the use of scarlet fever toxin as has been shown by Dick (1924) and by Zingher (1924). This immunization has been shown to afford definite protection to those showing positive skin tests.

At present our conception of scarlet fever from a bacteriological point of view centres about the haemolytic streptococcus found in the throat and nasopharynx, and its production there of a toxin which is absorbed into the system and gives rise to the rash and general symptoms of scarlet fever. Bliss (1922) has shown that the streptococcus concerned in scarlet fever does not produce agglutinins to any extent in the convalescent patient. Yet we know that an attack of the disease does confer immunity. It would seem reasonable then, to suppose, particularly in the light of recent work, that in scarlet fever we are dealing with a streptococcus capable of producing a toxin which in turn calls forth an antitoxic immune body, which confers immunity upon the patient.

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The Physiology of Globus Hystericus.—In the cases cited by Edmund Jacobson, Chicago, no difficulty in swallowing was observed or complained of. Moderate spasm of various portions of the esophagus was present with the experience of "globus." A fairly thick barium paste might in part remain thickly held in the esophagus for more than from ten to twenty-five minutes after swallowing. At another time, when no symptoms were complained of, the paste passed through without undue delay. Spasm of other portion of the gastro-intestinal tract might accompany that of the esophagus. Jacobson says that without denying a paresthetic element, it may be assumed that globus is essentially a spastic phenomenon. The walls of the esophagus, meeting in spasm, feel somewhat like a bolus of food and suggest to the patient the experience of a foreign body.—*Jour. Am. Med. Ass.*, Sep. 20, 1924.

THE CLINICAL ASPECT OF SCARLET FEVER*

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IT is not the intention of the writer of this paper to discuss the entire clinical field of scarlet fever. The observations presented, deal essentially with the symptomatology of this disease. Early diagnosis is very important for the control and management of any communicable disease, and accurate diagnosis is only possible when the medical man familiarizes himself with the clinical signs and symptoms of disease, obtained by examination at the bedside.

Scarlet fever is classed with the sub-group of communicable diseases, which have been termed the acute exanthemata; the other members of the group being, measles, German measles, smallpox and chickenpox. Medical literature leads us to believe that scarlet fever prevailed in the early centuries. The first accurate clinical description of this disorder was given by Sydenham following the epidemic which raged in London during the years 1661 to 1675. Scarlet fever continues to be prevalent, both sporadically and epidemically in various parts of the world. Our knowledge of this disease has not been increased to any appreciable extent by research during recent years, particularly as regards the infecting organism and a specific remedy.

The incubation period varies from two to seven days. The disease is ushered in suddenly with fever, headache, sore-throat, nausea or vomiting, chills, and frequently in young children, with convulsions. Pain on swallowing, and tenderness over the cervical glands at the angles of the lower jaw are constant features. Twenty-four to forty-eight hours from the onset, the characteristic eruption, which is later followed by desquamation, makes its appearance. The temperature declines gradually, and simultaneously the rash fades through a period lasting from four to seven days. Usually, the patient has entered convalescence by the tenth day of his illness.

A more detailed study of this disease requires a description of three important features:—(a) Fever; (b) The exanthem; (c) The enanthem.

Fever.—The temperature rising suddenly at the onset, ranges between 101° and 104°. It remains elevated until the eruption has fully developed, and then falls by lysis, during a period of four to seven days. This is in marked contrast to simple measles, which acts in a reverse manner. An elevation of temperature after it has reached normal, indicates either the presence of a complication or a relapse. The latter may be observed occasionally between the third and fourth weeks of the illness. It has been stated by some authors that scarlet fever may occur without any elevation of temperature. This condition has never come under our observation, and probably does not exist. Further variations in temperature will be noted below, when discussing the different types of this disease.

Exanthem.—The eruptive changes in the skin manifest themselves usually within twenty-four hours and rarely later than forty-eight hours from the initial onset. The skin feels dry, hot, and rough. The flushed and swollen cheeks, the deadly pallor about the mouth, and the sparkling bright eyes with congested conjunctivae, form a striking contrast to the bleary-eyed, blotchy face of a patient affected with measles. The rash, bright brick-red or pink in colour, appears first on the neck below the mandible, spreading rapidly downwards over the chest and trunk, involving the extremities last. Its intensity varies with the texture of the skin over different regions of body, being especially well marked on the abdomen. On first observation the eruption appears to be a confluent blush, but closer inspection reveals the fact that it consists of two elements; first, fine pin-point punctate red spots; second, an

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erythematous back-ground on which the spots appear. When the congestion of the tissues is marked, the spots tend to form fine vesicles, resembling miliaria. Pinpoint haemorrhages or petechiae are visible, especially about the anterior axillary folds. In a majority of the cases, the extremities are covered with a discrete mottled eruption. Brown staining shows early in the flexor folds of the elbows and knees. The rash begins to fade within two to four days, leaving a yellowish hue to the skin.

The congestion of the body tissues which is so evident during the acute stage, is followed by a stage of shrinking, with contraction of the vessels. The surface of the skin now becomes dehydrated and coarse, desquamation manifesting itself about the tenth day. In mild cases, this may be delayed until the third or fourth week. This diagnostic feature of scarlet fever may be observed in three forms:—(a) Powder-like; (b) Pin-hole and shreddy; (c) Flakes or plaques. The face appears to be covered with a fine white powder which may be removed with rubbing, during the first ten days. The typical pin-hole form which peels in shreds, is evident over the neck, trunk, arms, legs, and between the fingers and toes. Splitting of the skin along the finger tips at the free edge of the nails is frequently the first sign of beginning desquamation. Careful inspection of the palms of the hands and soles of the feet, shows the skin peeling in flakes, often coming away in casts of one or more of the digits. Many of the patients comment upon the dry, smooth, slippery condition of their hands, before desquamation commences at these sites. The importance of desquamation rests on the fact that the final diagnosis in many cases is made, only when this peeling appears.

Enanthem.—The intense hyperaemia noted in the skin and subcutaneous tissues is also present in other tissues of the body, especially the mouth and throat. You are all familiar with the dry, swollen, heavily furred tongue of the invasion period, which gradually desquamates, during the eruptive stage. This beefy-red tongue with its prominent papillae is slowly transformed until it presents a smooth, moist, greyish-pink appearance, with the papillae almost invisible, resembling a superficial glossitis. During early convalescence this organ returns to its normal state.

It was stated above that painful deglutition is practically always present. Examination of the pharynx shows intense hyperaemia and swelling involving this entire region. The tonsils are not only swollen, but may be covered with exudate of varying extent. An eruption corresponding to that on the skin, will be found over the soft palate. It is punctate in character, with an occasional petechia on the uvula. A muco-purulent discharge tends to accumulate on the posterior wall of the pharynx. Post-mortem examination has shown that the mucous membrane of the gastro-intestinal tract is in a similar state of congestion.

Thus it will be seen that scarlet fever has for its diagnostic sites, the tongue and pharynx, while its allied disease, simple measles, selects the buccal mucous membranes and respiratory tract.

Types.—Our knowledge on the bacteriology of scarlet fever will not permit a suitable classification on this basis. There are probably two factors to consider; the presence of the unknown scarlet fever organism, and in many cases an added streptococcal infection. It is difficult to know where the action of one begins and the other ends. The mildness or severity of the disease varies greatly with epidemics. The medical man may be helped in forming his prognosis of scarlet fever by recognizing four clinical types of this disease:— (a) Simple; (b) Toxic; (c) Septic; (d) Haemorrhagic.

Simple Scarlet Fever.—This type corresponds to the general description outlined above. The patient feels moderately ill, complaining of the throat, of headache and of discomfort due particularly to the general congestion and eruptive changes. The febrile period lasts about a week, the temperature and pulse declining slowly to normal. After ten days' illness, much difficulty is found in keeping the patient in bed, because he feels so well. Undoubtedly, cases do occur which do not show the presence of an eruption. These patients give a history of sore-throat, fever and enlarged glands. Careful observation will frequently reveal desquamation of the hands and feet about three to four weeks from the onset. This feature of scarlet fever is well to remember when the prevailing epidemic is of a mild type. Charts No. 1, 2, A. B. C.

Toxic Scarlet Fever.—The term "malignant"

has been applied to this group by many authors. Death occurs in the majority of the patients within the first few days of the illness. However, cases are occasionally encountered, which, though clinically resembling this fatal type, result in the recovery of the patient. The outstanding feature of the toxic type is the intensity of the scarlatinal toxaemia which is out of all proportion to the clinical findings described in the simple type. The nervous and circulatory systems are severely attacked from the outset. Delirium, mental stupor and, at times, unconsciousness are present within the first twenty-four hours of the invasion period. The temperature ranges from 103° to 106°; the pulse being rapid, soft and becoming irregular. Patients dying within twenty-four to forty-eight hours have a blotchy ill-developed eruption on the skin, with marked cyanosis of the mucous membranes and general oedema of the pharynx. Where the eruption is well developed, the colour is dusky rather than pink, and numerous petechiae appear. A slight cyanotic tinge of the lips and mucous membranes will be observed. Swelling and oedema of the whole pharynx are visible, without the presence of any exudate or mucopurulent discharge. Enlargement of the cervical lymph nodes is very slight. Where recovery is apparent, these patients must be carefully watched during convalescence guarding against the resulting myocardial changes due to the scarlatinal toxaemia. General weakness persists for weeks. See Chart 1.

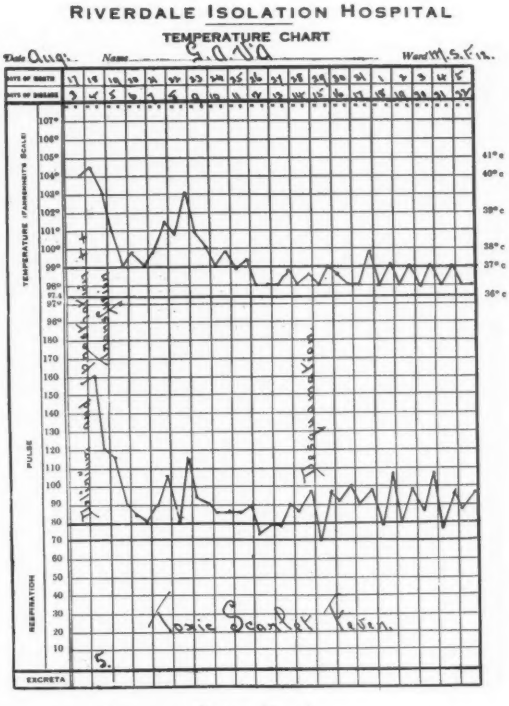

CHART No. 1.

Septic Scarlet Fever.—This type of scarlet fever is seen most frequently in young children. Many of the cases terminate fatally after a short or prolonged period of illness. The severity of the attack is due not only to the action of the specific organism of scarlet fever, but to the toxaemia and lesions of an added coccal infection, usually one of streptococcal origin.

The symptoms of the first twenty-four hours of this type do not differ to any extent from those presented by the simple type of moderate severity. Restlessness, insomnia, and occasional delirium manifest themselves very early. Difficulty in breathing and intense pain on swallowing are present due to the severe nose and throat lesions. The skin eruption is usually well developed, but inclined to be patchy in places. Haemorrhages into the skin occur as irregular purplish spots or petechiae. When the eruption fades, there remain irregular areas of brown-staining on the skin. The lips and tongue become dry and cracked. Eruptive changes on the soft palate are rapidly obliterated by the increasing oedema and hyperaemia of the tissues. Both tonsillar regions are intensely swollen, inflamed, and covered with yellowish exudate which is followed by ulceration in many cases. A tenacious mucopurulent discharge fills the entire pharynx. The nasal discharge, at first watery, becomes foul, purulent and profuse. A characteristic feature of this type of scarlet fever is the extensive involvement of the cervical lymph nodes. These become greatly swollen and tender, with induration of the surrounding tissues. This infiltration of the tissues is usually bilateral and extends forwards, almost encircling the neck. Marked head-retraction due to this adenitis and cellulitis of the neck and simulating that present in meningitis, takes place. Suppuration is not infrequent. The temperature, 103°—105° at the outset, remains elevated and irregular for two to three weeks,

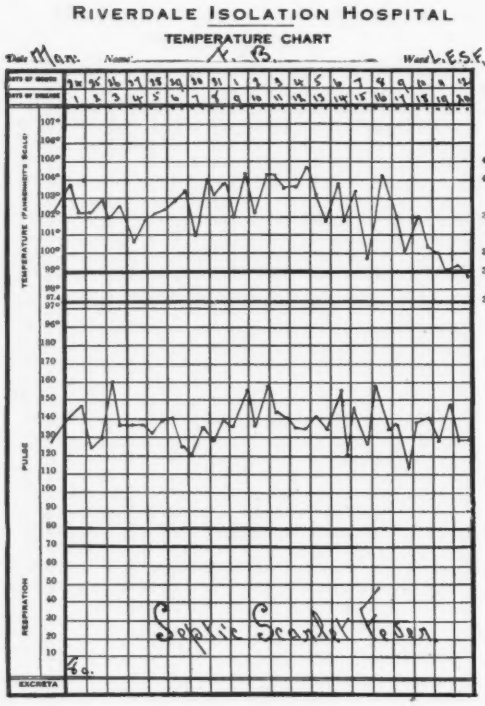

CHART NO. 2.

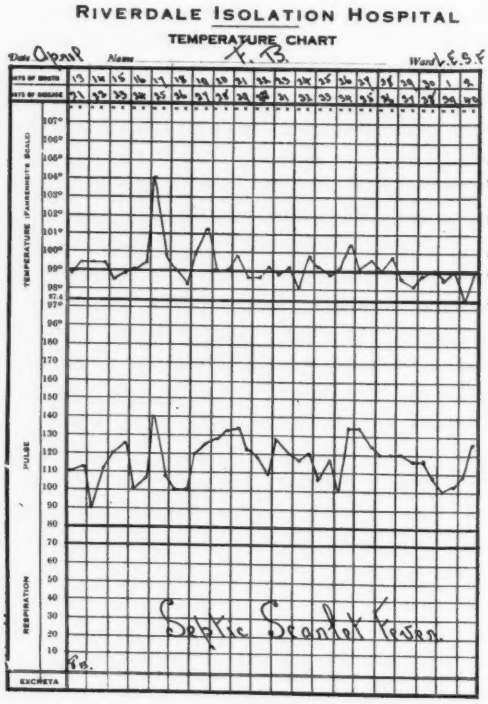

CHART NO. 3.

and where recovery takes place, falls gradually. The wasting and prostration of these patients becomes a marked feature in this type of the disease. Complications invariably accompany this septic type. These manifest themselves either during the acute stage of the illness, or in convalescence which becomes interrupted and greatly prolonged. See Charts No. 2 and 3.

Haemorrhagic Scarlet Fever.—This type has been included in the above classification because some of the early writers on this subject have described such cases. The clinical picture of the invasion period resembles the toxic or septic types, or a combination of both, and within forty-eight hours of the onset extensive haemorrhages occur from the various mucous membranes and into the skin and subcutaneous tissues. The patient usually dies before the eruptive changes have developed. Such cases have been extremely rare in the scarlet fever epidemics of recent years.

"It is not hidden from thee, neither is it far off. It is not in Heaven, that thou shouldst say, 'Who shall go up for us to Heaven, and bring it unto us, that we may hear it, and do it?' Neither is it beyond the sea, that thou shouldst say, 'Who shall go over the sea for us, and bring it unto us, that we may hear it, and do it? But the word is very nigh unto thee, in thy mouth and in thy heart, that thou may'st do it."—CHARITY. Osler

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Speech Defects after Encephalitis Lethargica.—I. Valiso reports the case of a child, aged eight years, who, in the course of convalescence after an attack of encephalitis lethargica six months previously, developed a spasmodic affection of the tongue. At the beginning of the attack speech was quite normal, then the tongue contracted spasmodically and became curved laterally, the mouth remained open, and the saliva dribbled. The spasm lasted for a few seconds and then speech became normal again.—*Arch. Internat. de Laryngol.*, May, 1924, p. 565.

HEART COMPLICATIONS IN SCARLET FEVER*

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DURING the past fifteen months 670 patients suffering from scarlet fever have been admitted to the Toronto Isolation Hospital, and it is from these that the cases presented in the present paper have been selected.

On a review of the records for this period, one is impressed with the small number of patients in whom symptoms have been observed which might in any way be referable to the heart, or cardio-vascular system. For the most part, the changes found are of such a nature, that they would suggest their being an intimate part of the scarlatinal infection, rather than a true complication of the same. There has been a total absence of evidence which would show the presence of any permanent damage to the heart resulting from an attack of scarlet fever.

In literature, and in text books, scarlet fever has been given a prominent place as one of the factors in the production of heart disease. In more recent years this view has been modified, and the experience gained from the patients seen in the isolation hospital would warrant the more moderate view. We know that definite myocardial changes of a pathological nature occur in scarlet fever. The chief of these are, dilatation of one or more chambers; the presence of a soft and flabby muscle often showing petechial haemorrhages; and microscopically, fragmentation of the muscle fibres. Instances of sudden death occurring in the course of scarlatinal infection have been cited by a number of writers. In the majority of these cases, the danger period has appeared to be between the third and the sixth day. The accident has frequently been associated with some extra effort undertaken by a patient suffering from a severe infection.

It would seem that the heart in scarlet fever may be affected in one of four ways:—(1) By the action of long continued high fever; (2) By the action of the scarlatinal toxins; (3) As a result of direct bacterial infection through the blood stream or lymphatics; (4) As the result of a complication such as nephritis. Three of these groups can be quickly disposed of in so far as they have any bearing on the case at present under review. No patient has been observed to suffer any cardiac complication as a result of unduly prolonged elevation of temperature. Nephritis has been an unimportant complication, and no cardiac changes have been observed to be associated with it; nor has there been a single patient showing evidence of active endocarditis, and only one indefinite and unproven case of pericarditis. This latter, was a septic case suffering from sinus and ear complications; she recovered after a prolonged course, and when last seen, had no evidence of any heart damage.

This leaves us only the question of what action the scarlatinal toxins may have. During the period cited, there have been sixteen patients who suffered from a prolonged tachycardia following their infection. That this rapid heart rate is the result of the toxaemia on the heart muscle would appear probable, but what the predisposing cause might be, is unknown. There are several points of interest to note regarding them. They were almost all cases of average severity of a non-septic type. The course of the temperature and the pulse rate, up to the time of defervescence was not remarkable. Following several days of normal temperature and pulse and without any evident cause, either in the appearance of complications or in the way of any additional effort or exertion on the part of the patient, the heart rate increased and remained at a rate definitely above normal for a period varying from some weeks to many months. The heart rate in these patients was on the average, from about 80 to 120. In five it was as high as 130 or over. With these patients the effect of the very mildest exercise, such for example as, sit-

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ting up in bed, has almost invariably been the production of a marked increase in rate. On auscultation of the heart many of these patients have shown the presence of a variable systolic murmur, either apical or basal. The same finding, however, is frequently to be made in patients suffering from any acute infection, and is certainly not considered to be of grave significance. One patient of the group under consideration developed a faint diastolic blow along the left border of the sternum, which suggested the possibility of aortic disease, but undoubtedly, diastolic murmurs are occasionally found in rapidly acting hearts and later disappear. In the case cited the diastolic murmur was not present on a recent examination. Apart from the condition described these patients all appeared very normal, and displayed no urgent cardiac symptoms. In none were there signs of failure, there was no cyanosis, and no evidence of acute dilatation or hypertrophy. All felt well. Because of a degree of uncertainty regarding the existing condition, all in this group were given a prolonged period of rest in bed, and a slow and graded convalescence, but, notwithstanding this, the majority were discharged with a heart rate still above the normal.

In one patient, not included in the above group, there was perhaps, more definite evidence of myocardial involvement. This was in a boy fifteen years of age, in whom, during an arthritic complication, a cardiac irregularity developed, which was almost certainly an incomplete heart block. This patient made a complete recovery, and now fifteen months later, has a normal heart.

In one other small group of three patients, all of whom were adults, and all acutely ill with a toxic type of the fever, symptoms of a more serious nature developed. These patients all appeared more dangerously ill. They were rather sallow and showed the presence of cyanosis. The apex impulse was diffuse, and in two was difficult to localize. The first heart sound was soft, and of poor muscle quality, and all showed the presence of a gallop rhythm. The pulse was soft and easily compressible. In two, on whom readings were made, the systolic blood pressure was low. In one 85/70, and the other 108/78. In only one of the three could an apical systolic murmur be heard. This last patient died on the eighth day of the disease, apparently from heart muscle failure; an autopsy was not obtained. These patients were acutely ill from the outset, and the dangerous cardio-vascular symptoms were not of sudden development, but were present more or less from the time of admission. The condition is certainly one to be feared. There can be little doubt that it is a toxaemia of the heart muscle or vasomotor system, or, a combination of the two.

The above groups comprise a total of twenty patients who have been observed in the course of fifteen months, and who have presented symptoms pointing to some cardio-vascular disturbance during, or following closely upon their infection. Of this number, one patient died, the remainder were all discharged from hospital. In none of these could any evidence be found of organic heart disease. Practically all showed some improvement prior to discharge. During the past month, fifteen of these nineteen patients have been seen, and re-examined. If we may judge from the history of their present activities, all are very fit. While in several the heart rate was more rapid than normal, this may have been due, in a large measure, to the stimulus of an examination. In none was any evidence obtainable of structural heart change.

In conclusion several doubtful points in the development of heart complications, which might lead to confusion in scarlet fever, or, in any other acute infection, should be mentioned. A systolic murmur, appearing during the course of the fever, or later, when some abnormal condition develops similar to those described, is not infrequent. This murmur may be haemic, or in other instances, may actually be due to a dilatation of one or more of the heart chambers, or to dilatation of the valve ring itself. The murmur will almost invariably be found to be transient, and rarely is there evidence of permanent cardiac damage. Irregularities, either of sinus origin, or ventricular extra systoles, are not infrequent, and while the latter are probably evidence of some muscle irritability, they have always been transient. In the absence of prolonged fever, for which there is no discoverable cause, it would certainly always be a wise precaution to think of an endocarditis as a possibility.

EAR, NOSE AND THROAT COMPLICATIONS OF SCARLET FEVER*

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THE purpose of this paper is to draw attention to the importance of ear, nose, and throat complications in scarlet fever and to discuss their treatment; this should have the following objectives in view:—

1.—The patient's immediate relief and future welfare.

2.—The rendering of the patient non-infectious in the shortest possible time.

During the last year 589 cases of scarlet fever were admitted to the Isolation Hospital, Toronto. In this number 160 ear, nose, and throat complications were noted. The following is a list of those occurring:—

1.—Acute otitis media	98 cases
2.—Acute mastoditis	10 "
3.—Sub-acute mastoiditis	12 "
4.—Acute accessory sinusitis	8 "
5.—Peritonsillar abscess	7 "
6.—Retro-pharyngeal abscess	2 "
7.—Purulent rhinitis	6 "
8.—Catarrhal rhinitis (persisting)	4 "
9.—Naso-pharyngitis "	7 "
10.—Acute labyrinthitis	1 "

Sinus thrombosis, brain abscess, labyrinthitis, and meningitis, when present, are practically always associated with acute or chronic otitis media and mastoiditis, being as it were extension of ear, nose and throat complications. Acute tonsillitis and acute septic pharyngitis have been purposely omitted from the above list. The degree of throat infection seems to depend on the presence or absence of tonsils and on the condition of these structures. If the reaction in the throat is limited to redness and swelling of the mucosa it is regarded as part of the general disease. If any exudate or membrane is present something else has been added, i.e., an infection which is practically always of a streptococcal nature. This throat invasion varies from the mildest exudate on the tonsils and possibly a false membrane, to one of the most intense reactions, with membrane spreading rapidly to the naso-pharynx and possibly to the larynx. Hypertrophied tonsils invariably become infected and swollen causing distress not only by presenting a large inflamed area but by obstructing the food and airways. The general condition of the patient almost invariably depends on the condition of the tonsils and pharynx.

Brilliant results have been claimed for the early operative treatment of septic tonsils in scarlet fever. Enucleation or pillar separation are advocated as early as the first week. Complications are said to be avoided by these measures but as the majority of complications occur in the first week of illness surely operation would have to be undertaken very early, viz.—at a time when the general reaction is at its height. At present it is the routine to treat the throat infection during the acute stage with repeated hot saline irrigations. Operative measures when indicated are not attempted until the reaction in the throat has subsided, i.e., in the third week or later.

With the throat infection there is necessarily some involvement of the naso-pharynx. Usually this will subside with the reaction in the throat, but frequently a subacute infection persists well into the convalescent stage. There is usually a rather copious muco-purulent discharge from the naso-pharynx and nose. The mucosa of these parts is congested and swollen. The lateral pharyngeal lymphoid masses are prominent and the cervical glands are enlarged and tender. In practically all such cases enlarged adenoid masses were removed and the symptoms rapidly disappeared. In other cases some nasal obstruction seemed to be the cause. An alkaline nasal lotion of warm Seiler's solution was very useful in helping to clear up these cases.

It is not surprising in cases with septic ton-

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sils that the infection should spread to the peritonsillar tissues. As a general rule the diagnosis of peritonsillar abscess presents no difficulty, but occasionally in young, short-necked children with relatively small throats and in those in whom the reaction is severe, the abscess escapes detection. If allowed to remain untreated such an abscess, apart from unnecessarily adding to the patient's distress, is liable to rupture spontaneously, possibly causing suffocation. An abscess in the retropharyngeal tissues occasionally develops which is apt to be confused with the peritonsillar abscess and is even more likely to be missed. Obscured by the tonsils, as these abscesses often are, it is only the increasing dyspnoea that makes one suspicious of their presence. Fortunately retro-pharyngeal abscesses seem to be less common in scarlet fever than in other infections. The treatment of both types of abscess is early incision and drainage.

With the throat infection there is generally some disturbance in the nose. This may vary from a mere congestion of the mucosa to a suppurative condition confined to the nose itself or including one or more of the accessory sinuses. In the acute stages, unless especially urgent, active treatment for the nose is not advisable. The mucosa usually returns to normal with the subsidence of the general reaction. Occasionally some infection persists, catarrhal or even purulent. In practically all these cases an enlarged adenoid mass is present or other nasal obstruction. Correction of these faults and the use of an alkaline lotion is sufficient by way of treatment.

Accessory sinusitis usually appears in the first week of the disease. Only eight cases developed sinusitis during the year, but these were of sufficient interest to report in some detail. The youngest patient developing sinusitis was four years of age, the eldest twenty-six. In no case was the infection limited to one sinus; the ethmoid and maxillary sinus on the same side usually became infected. In all but two cases the condition showed itself externally with redness and swelling over the sinus or sinuses affected. The case in the child of four years was of particular interest because of the infrequency of suppurative ethmoid and maxillary sinusitis so early in life and because the ethmoid abscess pointed externally demanding external incision and drainage of the ethmoid into the nasal cavity. In the majority of cases simple measures were sufficient to clear up the infection, viz: routine use of a nasal lotion and antrum lavage, repeated if necessary. In four cases it was necessary to make permanent drainage for the antrum through the inferior meatus of the nose. Accessory sinusitis in scarlet fever usually pursues a similar course to that of sinusitis from other infections. Sometimes, however, progression is alarmingly rapid and difficult to check. It is our impression that external signs are more frequent in scarlet fever. To illustrate the following case is briefly outlined:

On Nov. 15, 1922, the patient, a nurse, was admitted in a moderately ill condition. Her throat was septic with deep ulceration of the lateral lymphoid masses. One week later acute pansinusitis developed suddenly on the right side, with marked external signs, going on rapidly to peri-orbital abscess. The following week double otitis media appeared, to be followed ten days later by pansinusitis on the left side again with peri-orbital abscess. During this time the patient's general condition was fairly good in spite of frequent operations, a profusely discharging nose, and not infrequent earaches and headaches. On Dec. 23, acute symptoms developed in the right mastoid and were relieved by operation. Next week an abscess formed in the septum despite the fact that no intra-nasal manipulation had been undertaken for some time previously. Finally acute inflammation developed in the left mastoid, necessitating drainage. From this time, January 10th, general improvement was gradual till all the affected parts had healed with the exception of the right frontal sinus which was draining through a sinus over the right upper eyelid. Radical steps were taken to clear this up and it was found that extensive bone destruction had taken place. On June the 20th the patient was discharged apparently completely healed and in good condition, but it was felt that any fresh cold would light up the trouble in the frontal sinus.

That the presence of tonsils and adenoids seem to influence the occurrence of ear, nose and throat complications is apparent from a glance at the statistics for otitis media. Of the ninety-eight cases of otitis media only two were

free of these structures. Whether this is due to the mechanical action of the adenoid mass or to the increased infection noted in cases with septic tonsils it is not always possible to say. Certainly one notes a greater frequency in the occurrence of otitis media during the first week. The following table will show the incidence by week:—First week, thirty cases; second week, thirty-nine cases; third week, twenty-three cases; fourth week, thirteen cases; fifth week, eleven cases; later, twelve cases.

The onset of otitis media was practically always announced by earache of varying severity and by an increase of temperature. The insidious onset claimed by some to be characteristic of scarlatinal otitis was not observed. The onset did occasionally escape notice but this could usually be explained by lack of observation or by the patient's being too ill to complain. Widespread destruction of the tympanic membrane usually occurred in these cases, early incision of the drum undoubtedly conserving this structure. The routine treatment adopted for otitis media was one as conservative as possible consistent with thoroughness. During the third week the tonsils and adenoids, if present and at fault, were removed and any nasal obstruction corrected. No ill results by way of sepsis followed this procedure. The ears themselves were kept clean by frequent wiping with cotton wool. Following the throat operation the ears were further examined with a view to expediting healing by more radical measures. In cases where the discharge was profuse, foul and purulent, mastoid involvement was judged to be present. Twelve such cases were operated on, a simple mastoid drainage being done in each case.

Acute mastoiditis with external signs such as redness, swelling and tenderness over the mastoid process occurred in ten cases necessitating immediate operation. In cases in which the signs of mastoid disease are not so apparent its presence is apt to be overlooked. These become the chronic otitis cases seen later in life. The hearing becomes impaired and the patient is a menace to others because of the discharge. It is this type of case, one in which the disease is active and slowly progressive, that develops intracranial and other complications.

Authorities differ as to the question of mastoid drainage in scarlatinal otitis. Some are of the opinion that early operation is essential if the hearing is to be saved, while others claim that the operation is to be avoided if possible, as ill results may follow such procedure. It would seem rather difficult to lay down any definite rule, and wiser to judge each case on its own merits, as in any acute aural infection. The wide-spread destruction of bone said to be characteristic of scarlet fever was observed in one or two cases, but only in neglected cases such as one sees following any acute infection.

In the treatment of these complications of scarlet fever the great need for some preventative measures is very apparent. The rôle that the tonsils and adenoids play after scarlet fever is established, has been emphasized. Early removal of these structures as advocated to-day undoubtedly lessens the severity of the disease itself and the tendency to ear, nose and throat complications.

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Dangers from the Use of Petroleum Benzin.—The public health commissioner attached to the prefecture of police has investigated the use of petroleum benzin in hair-dressing parlors, which have had accidents. Not only have women been seriously burned, but explosions of this material have occurred in sewers when cleaners with lamps have gone into them. The health commissioner has ordered that the use of the product be discontinued.—Paris Letter, *J.A.M.A.*

SECONDARY PNEUMONIA; SOME THERAPEUTIC CONSIDERATIONS

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DURING the past half of the present year, the writer has had the opportunity of studying the effect of treatment in a large series of pneumonias complicating two extensive epidemics, one of whooping cough, and one of so-called "influenza." One is impressed with the fact that no disease taxes the therapeutic ingenuity of the physician to the same degree as do these secondary pneumonias. On the routine treatment of secondary pneumonia, I do not propose to touch. The necessity for good nursing, hygiene of the sick room, anatomical and physiological rest and comfort is the text of such an everyday sermon with all of us that even to mention it would be only to bore you. Suffice it to say that in no other cases is it so necessary that the physician should have a free hand. If he is hampered by the whims of parents, or the annoyance of poorly-skilled nurses, the best results are not obtainable. Frequent visits, even three to four per day, are essential during the first two to three days of illness, or until the physician is accurately in tune with the patient and the disease, and until nurses, parents, and therapeutic agents are working in complete harmony and proper guards mounted against complications.

Therapy, other than drugs.—The presence of mucus in the bronchial tree, will unquestionably demand warm, moist, fresh air, the degree of moisture and heat being indicated by the individual case. The tepid pack and counter irritation to the back and sides of the chest with mustard, are extremely valuable, but valuable entirely for their sedative action in conserving the patient's strength. Massage of the chest with stimulating oils does not seem to serve any useful purpose.

Diet.—There seems to be no single diet suitable to all cases, although certain fundamental principles are generally applicable. To give any modification of milk or any of the insoluble carbohydrates to a child whose tongue is thickly coated and who refuses food, is to court trouble. In this stage, warm diluted fruit juice, strengthened in food value by the addition of glucose or lactose and neutralized with bicarbonate of soda; and concentrated meat jellies, and essences in moderate amounts at frequent intervals, constitutes the only satisfactory diet.

It is at this stage that a 10% solution of glucose, per rectum, is most valuable and usually retained. Often a patient will retain more fluid and more nourishment by rectum than by mouth, during the first few days of illness. When the tongue clears and appetite and thirst return, skimmed milk may replace fruit juice in the formula, followed later by junket and cereal jellies. Malted preparations and protein milk have not been as satisfactory in my hands during the acute stage of pneumonia as the foods above mentioned.

The main objects in diet are first, of course, to make up for nitrogenous waste, and secondly, to prevent tympanites, and the formation of mucus in an intestinal tract, already loaded with mucus and in which vasomotor tone is very low, probably due to excessive vagal stimulation from the respiratory tract.

Specific Therapy.—Specific therapy in the form of sera and vaccines certainly has its ardent advocates, and in a single instance one felt that a mixed vaccine was the means of saving life when all else had failed. In the great bulk of cases, however, the disease seems so little influenced by vaccine therapy and at times is so greatly aggravated during the negative phase which follows the first inoculation, (and this combines with the undesirable attitude created in the mind of the unreasoning patient who is thus quickly driven to dread the sight of his physician) that one is forced to the conclusion that specific therapy in the secondary pneumonias of childhood, has not, as yet, been justified. We are, therefore, thrown back

on older and better established methods of treatment.

Drug Therapy.—No single drug can, in any way, be considered specific because the specific conditions requiring modification, vary in individual cases. These conditions are:—(1) Cyanosis; (2) Bronchial and laryngeal spasm; (3) Cardiac dilation; (4) Respiratory irregularity and failure; (5) Non-productive cough; (6) Tetany; (7) Tympanites; (8) Hyperpyrexia; (9) Insomnia and anxiety; (10) Excessive mucus production in the respiratory and intestinal tracts; (11) Secondary anaemia.

To deal with these conditions *seriatim*:—

1.—*Cyanosis.*—Of the value of oxygen mixed with atmospheric air there can be no doubt to those who have seen severe cases of pneumonia secondary to pertussis in whom artificial respiration is necessary every hour, as the patient is livid for days on end, and in whom violent convulsive spasms of coughing yield in the same way to no other treatment.

2.—*Bronchial and laryngeal spasms.*—Where pneumonia is ushered in with an alarmingly severe form of croup, as one frequently sees in children, the subjects of eczema, and in whom asthmatic manifestations dominate the picture. adrenalin is the sheet anchor. In cases where suspicion of laryngeal diphtheria has been roused and antitoxin administered without preliminary desensitization, one may expect the inevitable result; sudden death from anaphylaxis. Such cases demand the promptest action if life is to be saved.

Enclosed steam with the addition of wine of ipecacuanha will hold the ground gained by adrenalin for twenty-four to forty-eight hours, during which time the child has adjusted himself to his new conditions thereby removing the nervous element which is the main etiological factor in spasm. Antimony is probably extremely valuable in this condition, but its administration is a lost art, and it may be, that in adrenalin we have found an agent equally. if not more trustworthy.

3.—*Cardiac failure and cardiac dilation.*—When early digitalization is possible, other remedies are not so frequently necessary. Where this has not been done, or proves ineffective, camphor in oil, and strophanthin serve us in good stead. These remedies are too often reserved for the last few hours of life. Ten minims of camphor in oil given subcutaneously every eight to twelve hours, for a child in the second year may often be used advantageously to the exclusion of all other drugs, for several days. If necessary, strophanthin may be used in combination and seems to be life saving, in selected cases. The dose of strophanthin for a child twelve to twenty-four months is 1/750 grain repeated as required until the digitalis effect is secured. The value of strychnine is very secondary to that of camphor in oil. Caffein does not seem necessary.

4.—*Respiratory irregularity and failure.*—This yields to nothing so well as atropin. The dose during the second year is 1/300 gr. repeated every three hours if necessary for twenty-four to forty-eight hours. It loses its effect at the end of the second day.

5.—*Cough.*—Entering the back compartment of the modern drug store, one is impressed with the large number of proprietary remedies for cough, which fill the druggist's shelves, especially when the valuable drugs for this condition are so few. It makes one realize how much of our legitimate field is usurped by individuals and corporations calling themselves our friends to the detriment of the health of the public. In the treatment of cough, our resources are especially limited when this condition is the predominating symptom of a severe secondary pneumonia. Coal tar derivatives such as antipyrin may not be given at all, and opium derivatives only with extreme caution. Here it is that ether intramuscularly is particularly valuable, although enclosed steam, sinapisms, ipecacuanha, ammonium chloride vapourized or in fractional doses, will often make its use unnecessary.

6.—*Tetany.*—It is probable that latent tetany is more often an important factor in the production of the convulsions which complicate pneumonia than is generally recognized. For this reason calcium chloride should be used in a routine way throughout the course of any severe pneumonia. Oxygen is safer and more effective in controlling the actual convulsions than chloroform.

7.—*Tympanites.*—The prophylactic treatment which is the second main object of diet is all important. If milk and insoluble carbohydrates are not forced, in the early stage, and if the intestinal tract is kept free from exces-

sive mucus by a combination of rhubarb and soda, and copious warm alkaline enemata given at frequent intervals, other remedies will not be so often required. No harm will result and a great deal of comfort will follow if powdered willow charcoal is added to the food on the least sign of distension. If the condition becomes severe enough to demand pituitrin or milk of asafoetida (both of which are temporarily quite effective) there is probably a complicating peritonitis which will prove fatal in spite of treatment.

8.—*Hyperpyexia.*—This condition being only a symptom, the treatment is that of the underlying cause which must be carefully sought. It will be often proved to be an otitis media. Antipyretics may not be given although sudorifics such as the solution of acetate of ammonia are very useful in augmenting the action of the tepid pack and alkaline enema.

9.—*Insomnia and anxiety.*—Excessive cerebral excitation at the onset is best treated by a hot bath followed by a hot pack. Such cases are the ones in which alcohol may be used with great benefit for twenty-four to forty-eight hours but no longer. Brandy is of moderate value as food, and to dull the sensorium. It probably is a factor in the production of tympanites if used to excess.

10.—*Excessive mucus production in the respiratory and intestinal tracts.*—The secretion of mucus is essentially a protective process and predicates the presence of an irritant, bacterial, or chemical, injurious to the mucous membrane. There is probably no such thing as an over-production of mucus, but often this waste material cannot be carried off sufficiently rapidly and the harmful results of mucus stasis follow; normal secretion is inhibited. The question therefore arises, whether it is good therapy at any time to use drugs which inhibit mucus production; the balsams, terpinhydrate, etc.; or whether it is not better to confine ourselves to those drugs which liquefy mucus, such as the iodides, small doses of ammonium chloride, bicarbonate of soda, and normal saline solution.

11.—*Secondary anaemia.*—Secondary anaemia as a sequel, if incompletely treated, is one of the two main causes of relapse or recurrence. The other main cause is immunity incompletely restored. While iron and cod liver oil are useful restorative agents, one feels that they are too frequently used to the exclusion of blood transfusion which is usually much more rapid and effective in its action. The raising of immunity during convalescence by protein therapy is a field which gives much promise. Where intestinal complications have caused much trouble during the acute attack, cod liver oil will usually do more harm than good during convalescence.

Preoperative Preparation of Jaundice Patients.—An experimental study was made by Walters and Bowler of the toxicity of calcium chlorid used in the preparation of patients. They found that calcium chlorid, following its intravenous injection in a ten per cent aqueous solution, is rapidly eliminated from the blood stream and shows no tendency to accumulate in the blood. Following therapeutic doses, as used in these experiments, the blood calcium content returns to its normal level within two hours. The lethal dose of calcium chlorid, administered intravenously in ten per cent aqueous solution, at a uniform rate of 1 c.c. per minute, was 256.4 mg. for each kilogram of body weight in normal dogs; and in jaundiced dogs, 386.6 mg. for each kilogram of body weight. Following continued injections of calcium chlorid, including therapeutic doses, in normal and jaundiced dogs, no evidence of toxic effect on the kidney could be demonstrated, clinically or microscopically. The cardiac effect of therapeutic doses of calcium chlorid, as used in this study, is the production of various alterations in pulse rate. Toxic doses cause disturbances of conduction, ectopic origins of impulse, and when carried to the point of greater toxicity, ventricular fibrillation which is followed by the death of the animal.—*Surgery, Gynaecology and Obstetrics*, Aug., 1924.

THE PARTURIENT PERINEUM—ITS MANAGEMENT*

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IN speaking of the parturient perineum, I wish to refer especially to that of the primiparious woman. As is well known, the tissues of the levator ani and more superficially the urogenital triangle are capable of tremendous stretching, if it is done slowly and intermittently; otherwise these structures are rent and pulled apart.

There is always some damage to the soft parts, and this damage may involve, (1) only the most superficial structures, the fourchette, with slight or no damage to the perineum, or (2) the region of the vestibule may suffer from lacerations, often more or less stellate in character, radiating round the urethra and extending into one or both labia, or (3) the deeper structures may be involved, particularly the levator ani, sometimes the entire perineum down to, or including, the sphincter ani and the anus. It is true that in a certain number of women in whom careful examination shows no surface lesion, some break in the continuity of the deep structures takes place, involving fascia and muscles; but it is equally true that a certain number of primiparae go through labour with undamaged vulva and vagina so far as functional and mechanical purposes are concerned.

Under these circumstances the question arises:—Is there any procedure by which better end results could be obtained if adopted before the stretching had reached its maximum? In those that do tear, would such a procedure offer an easier repair, with better union and less cicatrix? Would it prevent more extensive lacerations, those lacerations which often extend up one or other side of the vagina to the fornix; or, again, would it prevent those annoying lacerations of the vestibule, lacerations which are not only difficult to repair properly, but which render catheterization necessary, thus adding to the risk of bladder infection, and delaying the proper involution of the uterus by reason of the over-distension of the bladder?

On this subject there has always been a divergence of opinion. Believing that median episiotomy offered itself as a proper procedure, Dr. Little introduced it at the Montreal Maternity Hospital in 1906; and since that time it has gradually been adopted as a routine in primiparous labours. The results have been uniformly good, and it is now extremely rare to see a perineum so treated, without perfect functional union.

Time is a factor in proper management of the perineum, but the welfare of the child must always be kept in mind; and it is unwise to allow the head to pound indefinitely and ineffectually on a too resistant vulvar barrier. The child, as a consequence, though born spontaneously, may be born dead, or so deeply asphyxiated that, even after resuscitation, it dies; and at autopsy, minute haemorrhages are found in the brain and other organs as evidence of unnecessary delay in the second stage of labour. Well-timed episiotomy would, probably, have saved its life by enabling the head which, in spite of good pains, had been on the perineum for an hour or more, to slip through spontaneously, or assisted possibly by pressure on the fundus. Episiotomy in many cases may, therefore, obviate the use of forceps.

It is, unquestionably, difficult to decide when a laceration will be inevitable. We know that the masculine type of pelvis or so-called "funnel pelvis" predisposes to severe lacerations, frequently of the complete variety. It is because the narrow pubic arch prevents the passage of the head close under the symphysis, sometimes forcing the head so far back that it is born through the posterior sagittal diameter of the pelvis.

Dry labours are frequently associated with severe perineal and vaginal lacerations, because

*From a symposium on the work at the Montreal Maternity Hospital reported to the Montreal Medico-Chirurgical Society, May 2, 1924.

the general intrauterine pressure being lost the head is driven back on the posterior vaginal wall by direct uterine action. Precipitate labours and malpositions, such as occipito-posterior and face presentations usually lead to severe lacerations. Contracted pelves, by causing impaction of the head in the pelvic cavity, also predispose to lacerations, as the head tends to extend before the occiput can escape under the pubic arch. When the perineum shows marked distension and the anus begins to dilate early while the tissues about the vulva lie flat, extensive laceration is almost certain.

The more extensive vaginal lacerations, however, usually occur during forceps delivery or breech extraction. Before attempting delivery in such cases, dilatation of the levator ani and perineum should be attempted, either manually by the so-called "ironing out" process or by means of a Voorhees bag, together with episiotomy on the bag.

The median episiotomy cuts chiefly the central points of insertion of the superficial muscles constituting the urogenital septum. Of the levator ani it cuts only the so-called "Luschka fibres," a few fibres running across between the sphincter ani and the vagina. Its repair, therefore, gives better union, with less rugged scar tissue and better preservation of function than does lateral episiotomy, which cuts the transversus perinei and bulbocavernosus muscles directly across their chief fibres.

By means of median episiotomy the jagged and more extensive lacerations are prevented, the repair is rendered simple and the result is perfect union with no interference of function. The operation is indicated when the vaginal mucosa begins to tear, even before any external tear is seen; indeed, the absence of external evidence of tear is no evidence of lack of damage for, even with good distension, the deeper structures may be so far stretched that prolapse of the uterus may result later.

The operation should be employed only in the perineal stage of labour, and is carried out during a pain when the vulva is distended. Two fingers are inserted between the head and the perineum, which is then cut in the median raphe for one to one and a half inches, depending on its length. If it is thought that the sphincter ani is likely to suffer, the anus may be pushed to one side, and the incision curved outward in the opposite direction as the sphincter is approached.

The repair is extremely simple. (1) a continuous, submucous suture, either single or double, of fine catgut, commences just above the apex of the vaginal tear, and is brought out on the skin surface at the level of the fourchette. (2) A continuous, subcutaneous suture begins at the lower angle of the skin incision and is brought out at the fourchette on the same level as No. 1 (3) Two stay sutures of silkworm gut are used to splint the deep tissues, though occasionally deep sutures of catgut are used for this purpose.

There is no special after treatment, except where the sphincter has been involved and even here the only care is to avoid too early opening of the bowels.

Angina Pectoris and Syphilis.—In spite of Disraeli's dictum as to the superlatively deceptive value of statistics, L. Gallavardin (*Presse Méd.*, July 16th, 1924, p. 598) ventures to publish certain deductions derived from an experience of 450 cases of definite angina pectoris. He has only included those cases of angina which follow exertion, and has excluded all cases developing in the course of valvular disease. Speaking generally, he has found evidence of syphilis in thirty per cent of his cases (including nine per cent doubtfully syphilitic). Separating these into groups he found eighty-eight per cent syphilitic in cases of angina associated with aortic insufficiency (constant in aortic aneurysm). In angina without aortic lesion the proportion of syphilis sinks to twenty per cent; the earlier the case (that is, below forty years) the greater the proportion of syphilis. In cases of angina with breathlessness after exertion in patients with high blood pressure the evidence of syphilis fell still lower—to fourteen per cent. These statistics show that it is not right to assume that angina pectoris means of necessity antecedent syphilis, a view taken by some cardiologists.—*Brit. Med. Jour.*

THE STUDY OF FUNGI IN DISEASES OF THE SKIN*

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WITH a view to determining the incidence of parasitic fungi in various skin lesions, examination was made of cases presenting themselves for treatment in the skin clinic of the Toronto General Hospital and the Hospital for Sick Children. These examinations have shown that, apart from ringworm which is caused by a fungus called *microsporon audouini*, many cases diagnosed eczema, occupational dermatitis and plant eruptions, etc., were found to be suffering from skin lesions due to the following parasitic fungi—trichophyton and epidermophyton.

These parasitic fungi were present in skin lesions on the hands and feet, in the groin and axillae and under the breasts in females. Both types of fungi—trichophyton and epidermophyton appear to produce similar lesions which could not be differentiated except from microscopic examination. In all cases the lesions caused severe or mild irritation. The lesion is vesicular in the beginning. Later, the vesicles break down and the skin becomes white and sodden in character. The lesions may become secondarily infected from scratching, producing a purulent dermatitis.

The irritation is worse in warm weather because of the greater moisture of the skin and the more rapid development of the fungus. In cold weather the lesions dry up, forming scaly patches which may again become vesicular with the return of warm weather.

The Lesions on the Feet.—On the feet, the lesions appear first in the fold between the fourth and little toes or the little toe and the sole of the foot. In the milder cases, there is a fissure of the fold with a slightly sodden skin. The disease may be so mild as to escape the observation of the patient or may be so severe that he is unable to walk. As the condition becomes more severe, tiny vesicles appear at the advancing border and the skin becomes more and more sodden. On the sole and side of the foot, and over the instep, where the skin is usually dryer, the earlier stage of the lesion consists of irregular groups of small vesicles deep in the skin. At a later stage the vesicles rupture, discharging serum, and still later the vesicular patch may be replaced by an irregular, slightly scaly area or even callous formation.

The Lesions on the Hands.—The lesions present on the hands resemble closely those found on the feet. They commonly begin on the apposing surfaces of the fingers and may spread to the palmar surface of the fingers, the palms of the hands or, occasionally, to the dorsal surface of the fingers and hands.

The Lesions in the Groin, the Axilla and under the Breast.—In the groin, the infection begins as slightly raised papules situated about the crotch, which, depending on the degree of moisture present, may be scaly or sodden. The papules spread peripherally, the border becoming raised, well defined and tending to form irregular patches with festooned edges which are sometimes covered with thick scales. At other times, the margin may be dotted over with oozing papules or pustules. Occasionally the patches clear up in the centre, forming circinate lesions or red scaly areas with well defined, slightly raised margins. The disease may be limited to the thigh or may spread over the genitals, the anus and buttocks. It is not infrequently present in the axillae and even beneath the breasts in women, where it presents the same appearance as in the groin.

Differential Diagnosis.—The only condition in the groin or axillae which might suggest fungus infection is folliculitis. The hair follicles become infected and the hairs are seen surrounded by a bead of pus close to the skin.

On the hands, the eruption produced by poison ivy and other toxic plants may lead to difficulties in diagnosis. Though these eruptions are accompanied by serous exudation,

*Read at the Annual Meeting of the Canadian Medical Association, June, 1924.

swelling, and the appearance of vesicles, as in fungus infections, close examination will show that the vesicles follow the lines of scratching and are not so evident on the apposing digital surfaces. There is usually the history of exposure.

An eczematous dermatitis of the hands appears on the dorsal surface as grouped vesicles with congestion and oedema and there is generally a wide spread eruption on other parts of the skin surface.

In washerwomen and those whose hands are exposed to soapy water a great deal, deep seated vesicles appear on the sides of the fingers, but on examination of a vesicle the parasite is not to be found.

The only condition resembling fungus infection of the feet is that of hyperhidrosis or increased sweating of the feet. Due to the constant moisture, the skin, especially on opposing surfaces of the toes, becomes sodden and whitish but, again in these cases the fungus cannot be demonstrated.

The Demonstration of the Parasite.—The material for examination was obtained by picking off the tops of vesicles and removing scales from suspicious lesions. A portion was examined directly under the microscope after mounting on a slide in 10 per cent. solution of potassium hydroxide; the other portion was used for culture on maltose agar.

Structure.—The parasite consists of two main parts, viz., the hypha and the reproductive body or spore, which may be compared respectively to the stem of the plant and the flowers or fruit. The hypha is made up of protoplasm within an enclosing membrane. It is segmented, branched, and reproduces by spore formation. The spores may be round, oval, crescentic or club like. The trichophyton suggests twigs or branches of a tree: whereas, the epidermophyton resembles irregular chains of beads running in all directions between the skin cells.

The fungi are forms of plant life: therefore, variation in the skin surface causes variation in the structure of the parasite just as changes in soil cause differences in plants. The appearance of the parasite will vary with age, degree of moisture, and even the thickness of the skin in which it is growing.

Mode of Infection.—The fact that the lesions are more commonly seen in warm weather and occur where the surfaces of two areas of skin are in close apposition and continuously moist, suggests heat as a predisposing cause of the infection.

The method of contraction is uncertain. It may be spread directly from one individual to another or it may be spread indirectly from the wearing of infected clothing or the use of infected water-closet seats. As affecting the feet, we feel certain the parasite is spread from the floors of public baths, especially shower baths. In one patient with infected feet we cultivated the same type of fungus from the leather insole as was cultivated from the feet. Cultures were obtained from the leather as late as four months after the patient had stopped wearing the shoes. Therefore, we believe that infected shoe leather may harbour the fungus for an indefinite period of time.

Treatment.—The crusts, scales and discharge should be removed with soap and warm water, the parts carefully dried and an ointment, such as Whitfield's, rubbed gently into the part each night. This ointment is made up as follows: benzoic acid 5 per cent, salicylic acid 3 per cent, in soft paraffin and cocoanut oil. In the morning, the grease should be wiped away and the part dusted with zinc oxide powder.

Treatment of the groin, axillae, and infected areas beneath the breasts in women should be carried out in the same way. X-ray treatment, using one-third the erythema dose once a week, apparently improves the condition by removing scales and thickened epidermis.

In view of the fact that shoes previously worn by the patient may harbour the fungus for a considerable period of time, it is advisable to destroy them. Socks should be changed daily and zinc oxide powder dusted into shoes and socks.

Conclusion

(1) Skin lesions, as a result of infection with the epidermophyton and trichophyton fungi, are comparatively common.

(2) Errors in diagnosis occur as a result of failure to make a microscopic examination of scrapings from the affected parts.

(3) The method of demonstrating the fungus is easily carried out.

(4) The source of the infection and the manner in which it is spread requires further study as the disease is undoubtedly on the increase.

. . . . . .

This work was carried out at the suggestion of Professor Duncan Graham with the object of demonstrating the clinical evidence by which this type of infection may be recognized. I beg to take this opportunity of thanking him and Dr. D. King-Smith for their most helpful advice and criticism while carrying out this work.

THE TREATMENT OF CHRONIC ULCERS OF THE LEG

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I THINK we all will admit the practical importance of treatment in chronic crural ulcers, from economic, social and medical standpoints. These cases are at a disadvantage on the labour market, both because of loss of time and decrease in their earning power. They are either chronic invalids at home, or charity patients in hospitals or institutions. Again these ulcers are a source of focal infection with either acute or chronic secondary inflammatory or toxic reactions and all-their protean sequelae. They are constant attendants at our surgical outdoor and indoor clinics. The chronicity of their course and their treatment often leads to indifference on the part of the clinician and they are handed over to the nurse or student dresser. Often no definite routine is carried out, each new dresser trying a different line of treatment.

The chronic, callous, indolent, non-specific crural ulcer is too well known to need any detailed description. The literature is extensive and the suggested methods of cure are numerous. Usually a multiplicity of methods means an inefficiency of each. Are there any indications for treatment we might learn from the etiology, pathology or course of the ulceration? They usually occur in individuals around middle life or beyond, who have not been very careful in their personal hygiene. They are very commonly associated with circulatory disturbances, and the direct exciting causes are usually trauma and infection. From the pathological side we have an ulcerative condition with a greyish, glossy, sluggish base. The granulation tissue is scanty and retarded, or exuberant and œdematous. The edges of the ulcer are rolled in or thickened, indurated and covered with sodden, dead epithelium. The surrounding skin is pigmented indurated and often eczematous, or the seat of a more or less sub-acute cellulitis. Epithelial growth is absent or greatly retarded. The discharge may be moderate or profuse and is usually irritating. Associated with the ulceration there is usually a thrombophlebitis.

The indications then, are to ensure from the first proper cleanliness in those who by their occupation are subject to prolonged standing or trauma of the lower extremities. Then from a therapeutic standpoint, the next important procedure is to improve the circulation; to overcome the stasis in the capillaries and replace it by fresh arterial blood. Our local treatment should be an attempt to convert a non-healing and surgically dirty ulcer into a healing one, or a clean wound.

There are two conditions under which treatment may have to be carried on. The ambulatory, which circumstances may force upon us; or the more ideal absolute rest in bed with elevation of the limb on pillows. The next step should be an attempt to convert a septic ulcer into an aseptic one, in other words the cleansing of the wound. *Cleanliness*, speaking surgically, cannot be over-estimated. The use of strong antiseptics is contra-indicated as they retard or even prevent the growth of epithelial tissue. A good method is to shave the limb, clean up the ulcer and the limb with green soap, followed by gasoline, ether and alcohol. If the base is very necrotic, or a cellulitis is

present, then hot moist, mildly antiseptic dressings, such as boracic acid or Dakin's solution may be applied and changed frequently until the granulation tissue and base assume a more healthy appearance. To get healing with the minimum amount of scar tissue we must have rapid healing or covering with epithelium, which means good granulation tissue. Our next aim then should be to stimulate rapid epithelization of the ulcer. This takes place when there is a healthy bed of granulation tissue, not exuberant or waterlogged, and when the granulation tissue is maintained more or less at rest or immobile and on a level with the surrounding epidermal edge. I think this immobilization of the granulation tissue after cleanliness is the most important point in the treatment. Immobilization may be maintained either by the dressing or may require splinting of the limb. We are all conversant with delayed healing of wounds over joints or other regions where there is a constant pull by motion on the wound. This is equally true of chronic ulcers.

In addition many methods of promoting closure of the ulcerative area or stimulation of the epithelium have been used. A method which I have been using in hospital cases and which has shortened the period of healing and given a smooth pliable skin overlying the ulcer is the use of a paraffin wax such as ambrine, which we are familiar with in the treatment of burns. When properly applied and the details of the procedure faithfully carried out, it has greatly hastened the healing of these old long-standing cases. When admitted to hospital, the ulcers are usually very foul; the patient is put to bed with elevation of the limb. The ulcer and the whole extremity are cleansed with ethereal green soap followed by gasoline or benzene, ether and alcohol; then warm moist dressings are applied and these are changed every four hours. In several days if there is not too great a degree of sepsis, the paraffin-wax treatment is started. The ulcer and surrounding area is well cleansed with gasoline or benzene, and then the whole surface dried by hot air from an electrical hair drier. It is essential that this be hot, and by keeping the drier in motion the hot air is not too disagreeable. Both the ulcer and the surrounding area are subjected to this hot air for several minutes, until the granulations have the appearance of being highly polished, and are perfectly dried. The paraffin-wax, heated previously in a double boiler, is then applied either by a camel's-hair brush or from an atomizer. The temperature on application should not exceed 150° Fahr. The degree of heat may be tested by the finger if no thermometer is available. The hot wax should be daubed on and not rubbed or brushed, and applied all over the ulcer and surrounding skin. The ulcer is then covered with a double-layer of sterile gauze and a second thick coating of wax applied. The wax acts as a splint to the ulcerated area. The whole is then covered with absorbent cotton extending some distance on all sides of the ulcer and the extremity bandaged snugly with a flannel bandage starting at the toes and going up to the knee. The important details are the drying of the ulcer by the hot air after cleansing, the stimulation by the hot air of the surrounding tissues and ulcer, the application of the wax to the ulcer and surrounding area so that there is good cohesion and finally the cotton and flannel bandage. The dressing may be changed daily at first, depending on the discharge. The wax dressing comes off readily and does not adhere or destroy any of the epithelial cells. The same procedure is carried out at each dressing, namely, washing with gasoline, drying, application of wax, gauze, wax, absorbent and finally bandaging.

Healing usually takes only one to two weeks, depending on the size of the ulceration. The next most important step when healed is not to allow them out of bed for another ten days to two weeks until the epithelium has increased in thickness and is hardened. During this stage no dressing is used, but only a flannel bandage applied snugly. During this period they are also measured for a canvas stocking and when ready this is applied while in bed for a short time until they get used to it. The after treatment is as important as the earlier. If they do not wear a properly fitting canvas stocking, they must wear either a flannel or crêpe bandage. They should be given explicit directions as to the proper cleansing of the limb every night with warm soap and water, the washing of the bandage every night or every other night, and its reapplication every morning immediately on rising. This method

may be employed also in ambulatory cases.

Other methods which have been reported might be quickly enumerated:—

Powders.—Their use is limited, and is restricted to those cases with a scanty discharge and where the ulcers are comparatively clean.

Solutions are indicated in cases showing complicating cellulitis and as a preliminary measure to clean up the surface of an ulcer. Solutions such as boracic acid, saline, Dakin's solution, calamine lotion, etc. may be used.

Ointments are supposed to soften thick epidermis and stimulate granulations but they should never be used when the discharge is profuse or irritating as they will produce a dermatitis of the surrounding skin. Ointments, such as balsam of Peru, ichthyol, Lassar's paste, scarlet red, have been used.

Wax, Gelatin, Starch and Glue preparations. These afford usually more support and immobilization to the granulation tissue and have the additional benefit of stimulation by the heat.

Strapping with zinc oxide adhesive plaster, either by the basket method or Gurd's method is indicated especially in ambulatory cases and is an excellent method, as again it immobilizes well.

Operative Procedures such as incision, excision, liberation of base of ulcer, periarterial sympathectomy have been suggested. Skin grafting, either Thiersch or pedunculated grafts have been used, but they require longer periods of confinement to bed. The sponge graft is reported as giving good results.

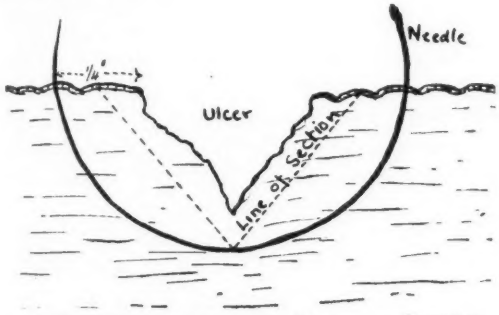
To reiterate the essential indications for treatment are: 1. Cleanliness. 2. Improvement of blood supply by recumbency, elevation and compression. 3. Immobilization of granulations by dressings, such as wax or splint. 4. Proper support after healing.

SMALL ULCERS OF THE TONGUE

A. P. Bertwistle, M.B., Ch.B.

SMALL ulcers of the tongue occurring in the middle aged—more especially when appearing singly—arouse the suspicion of malignancy, if they do not readily respond to ordinary treatment.

To deal successfully with these cases it is essential that an early and thorough investigation should be made, including, of course, microscopic examination, particularly of the tissues at the base of the ulcer. With this object in view the following simple procedure has been devised, and has been found satisfactory in practice.



Cross Section Ulcer with Needle in Position

The base of the ulcer, and its neighbourhood are anaesthetised with 2% novocain and adrenalin, an ordinary hypodermic syringe being sufficient for the purpose. A semi-circular needle is inserted a quarter of an inch from the margin of the ulcer, made to surround it coming out at a point a quarter of an inch beyond the opposite. The tongue is steadied with the help of the needle, and a wedged shaped piece is excised, including the base of the ulcer, care being taken to leave sufficient on either side to ensure the stability of the suture which follows. The needle is then threaded with catgut, and the stitch completed in the usual way. Generally it is found that only one stitch is necessary, but should it be thought wise to put in more than one, the ends of the original should be left long, and used for the purpose of steadying the tongue.

By the adoption of this method the following advantages are obtained:

1. The all important base of the ulcer is available for microscopic examination.

2. The wound heals more readily than would even a simple ulcer.

3. Haemorrhage is slight, and readily controlled.

Case Reports

A CASE FOR DIAGNOSIS*

L. M. Murray, B. A., M.B.

Assistant Resident Physician, Hospital for Sick Children, Toronto

R. S., age fifteen months. Admitted to the Hospital for Sick Children, Nov. 13th, 1923.

Family History is negative.

Previous History.—This child was admitted to Hospital for Sick Children on Sept. 15th, with nasopharyngitis and fermentative diarrhoea, and was discharged from hospital Sept. 22nd, in good condition. On Oct. 15th, he developed "a bealing ear" (left), which was treated outside the hospital and cleared up in about one week.

History of present illness.—The child was quite well from October 22nd to November 13th. Early that morning the mother was awakened by the baby screaming, and she noticed that he drew up his right leg. She picked him up, and he vomited a small quantity of milk; shortly after this, she observed that he did not appear to use his left arm and leg. Within the next few minutes, the baby had a "spell," during which he appeared to stiffen out and to turn blue. This attack lasted from two to three minutes, after which he lay quite limp. As the weakness of the left arm and leg persisted, the baby was taken to the family physician, who referred the case to the hospital for admission. The child's temperature on admission to hospital was 100°.

Clinical course.—On admission, the baby was fretful and irritable, and kept moving the right arm and leg in a purposeless manner. Physical examination revealed the following positive findings:—(a) Left-sided facial weakness was present to a slight degree only. (b) Child made no effort to move the left arm and leg, but could move the leg a little, when stimulated to do so. (c) Left arm definitely spastic, left leg slightly spastic. (d) Babinski test on left side showed an extensor response, i.e., dorsiflexion. (e) Child had a tendency to keep the face and eyes deviated to the right, and could not be attracted to look to the left. (f) No neck rigidity, no Kernig's sign, no Brudzinski's sign. (g) Reflexes of left side more active than on the right. The cerebro-spinal fluid obtained by lumbar puncture was clear and under increased pressure; the cell count was 153 per c.mm., all of the cells were lymphocytes; the Noguchi test for globulin was faintly positive; no organisms were obtained on direct smear or culture, and the Wassermann reaction was negative. The tuberculin skin tests were negative; the white blood cell count was 8,200, and the blood Wassermann reaction was negative. The child remained in hospital for two weeks, and although he showed no marked change in his general condition, the following points are of interest:—(1) The temperature reached a maximum of 103° on the third day, was normal on the fifth day, and continued normal. (2) The cell count in the spinal fluid two days after admission was 214, of which 98% were lymphocytes. Ten days later, the cell count was 9; all were lymphocytes; Noguchi test for globulin negative. An examination of the fundi four days after admission showed the optic discs clear in outline, but the vessels of the right retina and disc were more tortuous and larger than those of the left. The right disc edge was not quite as clear in outline as the left. Ears, accessory sinuses, chest, and abdomen, revealed no positive findings of value.

Two weeks after admission, the deviation of the face and eyes to the right had lessened considerably; the child was still rather fretful and irritable; all deep tendon reflexes of left side remained slightly more active than on the right side; there was general hypertonicity of left arm and leg, more marked in the arm, and the Babinski test on the left side continued to show the extensor response.

The patient was discharged a few days later, and when seen three weeks later, the power of the leg was very much improved; the arm had improved to some extent, and the

*From the wards of the Hospital for Sick Children and the Department of Pediatrics, under direction of Alan Brown, M.B.

child appeared to be slowly but steadily recovering the use of these limbs.

Comparison with a similar case.—L. A., age fifteen months, was admitted to hospital with a paretic condition involving the face, arm, and leg on the right side of the body.

This child was well until three weeks before admission to hospital (Oct. 24th, 1923), when she developed frequent vomiting attacks occurring about half an hour after taking food. Two days before admission she developed weakness of the right arm, and the day before admission she had several convulsions of variable duration, during which she had twitchings of the right arm and right side of face. She was seen in the out-patient department, where a diagnosis of polio-encephalitis was made, and admission to hospital was advised. The child remained in hospital for two weeks, and the points of interest in the clinical course of the case have been summarized as follows:—

On admission, she was irritable and fretful; showed a tendency to keep her face and eyes deviated to the left, but could look to the right. The right side of the face was weak, she had no power of movement of her right arm, and could move the right leg only feebly. There was slight spasticity of these limbs. All tendon reflexes of these limbs were hyperactive.

The temperature on admission was 101°, reached a maximum of 104° on the same night, fell by lysis to normal on the seventh day, and continued normal. Lumbar puncture on admission showed clear fluid under increased pressure, with a cell count of 136 (96% lymphocytes); the Noguchi test for globulin was positive, no organisms were found on direct smear or culture; the Wassermann reaction was negative. Tuberculin skin tests were repeatedly negative; the white blood cell count was 10,600; the blood Wassermann was also negative.

The convulsions continued at irregular intervals for two days after admission, and then ceased, without further treatment than lumbar puncture.

Two weeks after admission, there was practically complete recovery from the right-sided facial weakness; the power of movement of the right leg had improved considerably; the right arm showed some slight improvement, though the deltoid and triceps muscles were still very weak; reflexes still hyperactive.

The patient was discharged a few days later, and when seen after one month, there was evidence of gradual improvement having taken place in the power of the right arm and leg, though the arm still showed some incoordination.

This case, therefore, shows a condition of essentially the same character though involving the opposite side of the body to that affected in Case No. I.

Treatment.—Lumbar puncture was done about every second day to effect partial drainage of spinal fluid and for cell counts. The child received milk diet while there was elevation of temperature, then "soft diet" as outlined in hospital standing orders. Careful nursing care completed the treatment, and the child made a satisfactory recovery.

One cannot say a great deal relative to the prognosis, but it would appear that the immediate prognosis is fairly good, as in both cases the condition showed steady improvement. As to the ultimate result one can only speculate.

Discussion on the Diagnosis.—Poliomyelitis and polioencephalitis superior were considered, but excluded for the following reasons:—Both cases showed a lack of the sensitiveness to handling so usually seen in poliomyelitis; the weakness of the limbs was spastic, rather than flaccid; the reflexes remained hyperactive throughout, and the extensor response to the Babinski test pointed to an upper motor neuron lesion, probably cortical, with involvement of the pyramidal tract, rather than to a lower motor neuron lesion, with its flaccid paralysis and loss of reflexes from involvement of the anterior horn cells.

Tuberculous meningitis was excluded by the history, spinal fluid findings, lack of response to the tuberculin skin tests, and the subsequent course.

Syphilitic thrombosis might produce this clinical picture, but with negative Wassermann reactions on blood and spinal fluid, together with a negative family history and an absence of symptoms of syphilis, this diagnosis was also excluded.

Epidemic encephalitis and encephalitis lethargica.—These are characterized by general disturbances including unconsciousness, lethargy

and stupor, with involvement of the bulbar nuclei producing oculomotor symptoms, frequently relative to the third nerve, possibly also of the fourth and sixth nerves. The spinal fluid cell count as a rule is not high. As these cases have shown irritability throughout, with no sign of lethargy or stupor, and with no third nerve involvement or other persisting ocular symptoms, this diagnosis is improbable.

The diagnosis arrived at by the neurological service of the hospital was that of *toxic meningo-encephalitis*, and their decision was based largely on the paper of Orr and Rows[1], as reported in *Brain*. In this paper these writers give clinical, experimental, and histological evidence to show that certain infections of the central nervous system are due to a "toxi-infection." The conditions which they include in this group are myelitis, meningitis, tabes dorsalis, dementia paralytica, poliomyelitis, and polioencephalitis superior. They demonstrate the continuity of the lymph stream in the peripheral nerves with that of the spinal cord. This was shown by a method of injection into the nerves of organisms and coloured substances by which they proved that the lymph stream was an ascending one running towards the cord, and that the main current lay at the periphery of the nerve bundles immediately under the fibrous sheath.

These authors further state that as the passage of infection along peripheral nerves has been deduced for many years in regard to tetanus and rabies, a wider application of the fact may now be made, such that not only organisms but chemical and inert substances should yield equally instructive results relative to the ascending lymphatic stream from peripheral nerves to spinal cord.

In their further investigations experimental evidence showing that a lymphogenous infection of the central nervous system produced degenerative lesions was sought. Following upon examination of clinical material which showed that the lesions in the central nervous system had a definite anatomical relationship with the nerve supply of peripheral infective areas, and that these lesions depended upon toxic diffusion along the perineural lymphatics, experimental proof was obtained by the method of placing a celloidin capsule containing a broth culture of staphylococcus aureus in contact with the sciatic nerve under the gluteal muscles, in one series, and under the skin of the cheek in a second series. The capsules were left *in situ* for periods of from two to six weeks, control experiments being carried out with capsules containing sterile broth. The tissues were prepared for examination of the expected degenerative changes in the medullated fibres of the nerves, cord, medulla, and pons, using Marchi's osmic acid method of staining. Their conclusions are briefly as follows:—

(a) In spinal and cranial nerves there is an ascending lymph stream ascending to the central nervous system, whose main current lies in the spaces of the perineural sheath.

(b) Toxins reach the spinal cord and brain by this route, and although they spread to some degree in the lymph spaces of the pia-arachnoid, (and so may affect structures at a distance from the point of entrance) they pass for the most part in the main stream along the nerve route into the substance of the central nervous system. Outside the central axis, the nerves are probably protected by the vital action of their neurilemma sheath; or, more likely, the deciding factor is the peripheral situation of the lymph current.

(c) Histological examination showed that the toxins had induced inflammation of the tissues, particularly the epineurium, the perineurium, and the veins and capillaries outside and inside the nerve.

Orr and Rows[1] appear to have demonstrated that, in addition to blood-borne infections of the central nervous system, there is a distinct lymph system transmission of infecting agents and by this they explain the infection in the various conditions previously mentioned.

Conclusion.

This case, together with the history and course of a similar case outlined, gives the picture of an affection of the central nervous system, which is apparently not poliomyelitis, not tuberculous meningitis, not encephalitis, nor yet a condition due to syphilis. Assuming the establishment of the claims of Orr and Rows, are we not justified in making a diagnosis of a "toxic infection," probably a toxic meningo-encephalitis, leaving as an open question the mode of infection, whether lymph-borne or

blood-borne, keeping in mind that the clinical picture shows evidence of a cortical lesion, to which area the vascular supply is derived largely from one vessel, namely the middle cerebral artery.

REFERENCES

(1) ORR AND ROWS, Lymphogenous Infection of the Central Nervous System, *Brain*, 1914, vol. xxxvi, parts III & IV, page 271; Further Observations on Experimental Toxi Infections of the Nervous System, *Brain*, 1917, part I, page 1.

FOREIGN BODIES IN THE STOMACH

W. H. WARDELL, M.D.

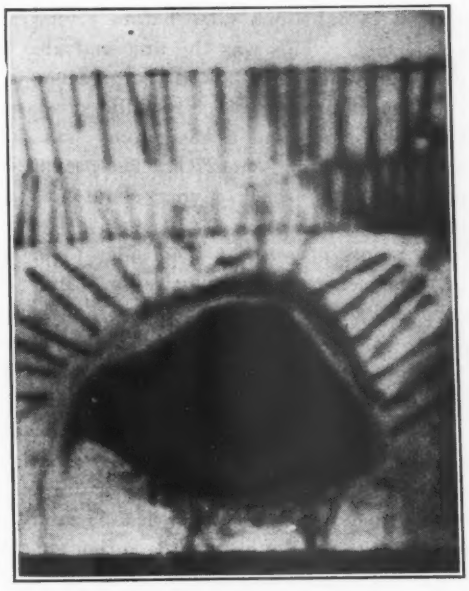
Moose Jaw

Miss E. R., aged sixteen years, was seen by me September 20th, 1924. She was mentally deficient and greatly emaciated. A divergent squint was present in the left eye. She had not been a normal child at any time; she seldom or never played with other children and had progressed only to third grade in the public school. Her appetite was capricious and at times ravenous.

I had seen her about two years previously suffering with a glossitis, the tongue filling the mouth to such an extent as to prevent proper closure. This lasted, I think, for about two months, gradually disappearing. I was unable at the time to assign a cause for this. Now, I am inclined to put it down to gastric conditions and probably local injuries from swallowing foreign bodies. The patient had suffered for many years from constipation and dyspepsia, although little or no professional assistance had seen sought. Parents are both decidedly neurotic.

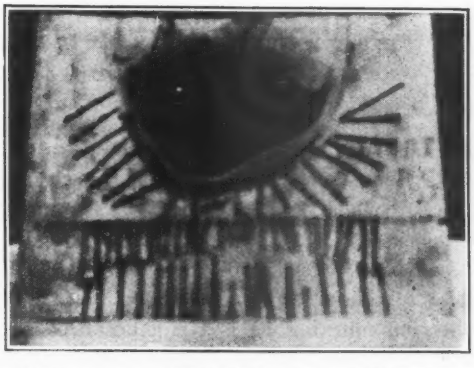
On *examination* of the patient I found a mass in the left lumbar region of the abdomen about the size of my two fists. This could be brought down when the patient sat up and would slip back again on resuming the recumbent position. My first consideration was the probability of a renal tumour. Examination of the urine revealed nothing. I suggested to the mother the probability of the patient swallowing such things as marbles, gravel stones and other foreign bodies. This seemed to make her a little indignant; the patient denied it, and the mother also up to a few minutes previous to taking the skiagraph on Sept. 26th.

On Sept. 24th the father telephoned that the mass had shifted to another part of the abdomen. I immediately went over and found it in the lower part of the abdomen below and



DETAILS OF THE SKIAGRAPH

The round shadow is a ten cent piece on the umbilicus. The piece of glass is showing about 2¼ inches to the right and a little below the umbilicus and separated from the mass of nails about 1¼ inches. The oblong shadow to the right of the mass may be a flat key or four nails agglutinated together. We did take four nails from the first part of the duodenum, but I had hoped simply to remove the main mass from the stomach in as short a time as possible as the only means of this patient regaining some weight and strength, and to leave any wanderers from the mass to take care of themselves for the time being.



DETAILS OF THE PHOTOGRAPH OF THE SPECIMEN

The large black mass represents 2¼ lbs. of nails which were arranged on a light piece of cardboard, and a number representing the different sizes laid out separately.

somewhat to the right of the umbilicus, giving to the hand the feeling of crepitus similar to that of a bag of small marbles.

On Sept. 26th, they consented to a skiagraph being taken, the roentgenologist being instructed to take one view before giving any barium meal. This was the first and also the last. The skiagraph showed the presence of a collection of nails or other metallic substances as shown below, and a gastrotomy was done on the morning of Sept. 27th. The patient did not survive the shock, dying about 4.30 the same afternoon.

The points of interest I consider to be are (1st) the neuroses of the parents; (2nd) the neurotic and mental deficiency of their offspring; (3) the bearing of these facts upon the education of not only deficients but of normal children through example.

The father was a carpenter and the child had often seen him put nails in his mouth as carpenters do. Except for one piece of glass, nothing but wire nails had been swallowed, and I have no doubt she had thought her father had swallowed some of these nails. On reflection the father thinks the practice started when the child was about seven years old, and therefore has persisted over a period of nine years. A few of the nails were corroded to thin splinters while others seemed fairly fresh and comparatively recently swallowed.

SEVERE TOXAEMIA FOLLOWING BEE STINGS

HUGH MACKAY, M.D.

Dermatologist, Winnipeg General Hospital.

Mr. H. E. W.. Age 41; farmer. Seen in St. Boniface Hospital for the first time July 25, 1924. Physician, Dr. F. Walkin, Ochre River, Man., to whom I am indebted for the history of the case.

June 28, 1924.—The patient was stung in the tibial region of the right leg by a bee. The following morning he had a generalized urticarial eruption, red and very itchy. Under soothing treatment locally the eruption disappeared promptly, but the right leg swelled to twice its natural size, and became painful. Two days after being stung, bullae developed in the axillae and the groins, and the lymph glands in these drainage areas became enlarged and tender. Fresh bullae appeared in different parts of the body. The skin of the axillae began to exfoliate. The temperature rose to 102°. Pulse 108 to 120. Chills developed, and the patient was acutely ill.

Twelve days after the first experience he was stung again, this time on the index finger of the left hand. When I first saw the patient at the hospital he was in a pitiful condition, presenting bullae in different parts of the body, with generalized exfoliating dermatitis. The skin was thrown off in huge sheets. Colloidal baths gave great relief. Sodium bicarbonate was administered internally. He improved rapidly, and after five days' sojourn in the hospital was allowed to return home.

The literature records several cases of death following multiple bee stings. Hansen reports a case of a healthy woman of thirty-nine, who died four days after a single bee sting in the leg. There was no local reaction. In this instance the sting is supposed to have been deposited intravenously.

The attached photograph of my patient was taken July 30, 1924. The skin is clearing rapidly. Small ulcers still mark the site of the sting in the leg, and also on the index finger. Convalescence was uninterrupted, the skin re-

turning to normal, and the enlarged lymph nodes gradually reducing in size without breaking down. He had been stung several times in years gone by, without developing cutaneous reactions.

Two theories are usually advanced to explain the symptoms in bee stings. One, that they are due to the introduction of formic acid, producing acidosis, and the other, to a toxic protein constituent, giving rise when injected to a condition closely related to, if not identical with, anaphylactic shock.

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VAGITUS UTERINUS

C. S. MORTON, M.B., F.A.C.S.

Halifax

The following incident occurring in my practice may prove of interest to the profession.

Mrs. J., aged thirty years, a multipara, was admitted to the Grace Maternity Hospital, Halifax, on the 28th of August, 1924. Five previous labours had all been terminated by forceps, with four living children. The last labour, two years ago, had been induced at or near term. I did the same in this case, and on the 29th of August, pains began in real earnest. Vulva gaping. Head, L.O.A., had not engaged though os was fully dilated and membranes ruptured. Pelvis was generally contracted but borderline; the sacral promontory being rather more prominent than normal. With the history, it seemed a case for high forceps. The hand was introduced into vagina to note position, etc., when the child was heard to cry very distinctly. All present, three nurses and house surgeon, noted the intra-uterine cries, which lasted for over a minute and could be heard anywhere in the room.

I endeavoured to save the baby, and immediately decided to do a version. This was easily and rapidly performed, and delivery, all but the head, was made in a very short time.

Unfortunately the head was of the hard, round, bullet-shaped type, and would not deliver readily because of the sacral promontory, so that ere it could be delivered the child was dead and did not respond to efforts at resuscitation.

It weighed 10 lbs. 11 oz. There was no laceration, and mother made an uneventful recovery, leaving the hospital on the eleventh day.

Fate and Function of the Ovaries After Hysterectomy.—The report made by Alice Freeland Maxwell, San Francisco, consists of an analysis of the surgical menopause as it occurred in women with and without ovarian tissue. The frequency, severity, time of onset and duration of ablation symptoms have been studied and contrasted with similar disturbances of the natural menopause. Factors that might tend to modify these symptoms have been reviewed and grouped according to the age of the patient, her general condition before operation, the pelvic pathologic condition and the type of ovaries that were retained. The value of the conserved glands has been balanced against their tendency to degeneration. To complete the study, results with ovarian therapy have been included. The material consists of 500 cases of hysterectomy, followed from one to eight years. If the normal menopause is accepted as a control, this analysis indicates that: 1. The frequency of vasomotor symptoms after hysterectomy is increased when both ovaries are removed. 2. The frequency of symptoms with conserved ovaries after hysterectomy compares favourably with that of the normal menopause. 3. Severe vasomotor symptoms are more common without than with ovaries. 4. The onset of delayed symptoms indicates that a definite number of conserved ovaries will atrophy within a year after operation. 5. The average duration of symptoms of the normal and surgical menopause is about two and one-half years. 6. Women with low hemoglobin are more likely to develop postoperative disturbances. 7. The frequency of symptoms depends in large measure on the type of tissue retained. 8. Retained healthy ovaries are not susceptible to degeneration.—*Jour. Am. Med. Ass.*, Aug. 30, 1924.

Editorial

THE MEDICAL TREATMENT OF HYDROCEPHALUS

AT the last meeting of the American Pediatric Society, Dr. Marriott of St. Louis, presented a paper on the "Medical Treatment of Hydrocephalus." He pointed out the fact that in certain cases of nephritis with oedema there appeared to be present in the blood a specific substance which lowers surface tension and promotes oedema of the tissues. In illustration of his contention we would direct our readers' attention to an abstract which appears in this issue of two papers recently published by him. One a very interesting case of oedema with all the symptoms of an acute nephritis, but in which the oedema appeared to be almost entirely due to the presence in the blood of a substance which, by lowering the surface tension in the blood vessels, favoured the escape of serum into the tissues and thus produced the oedema. When a drug is given that raises the surface tension of the blood vessels, the course of the fluid is reversed and diuresis occurs not directly owing to an action upon the kidney but to the increased quantity of fluid in the vessels themselves. Theobromine sodiosalicylate appears to have a very definite effect in thus increasing surface tension and checking oedema of the tissues and the idea suggested itself to Dr. Marriott that in the communicating type of hydrocephalus, absorption of the spinal fluid by the subarachnoid might be favoured by raising the surface tension within the blood vessels by the administration of this theobromine sodiosalicylate. Acting on this hypothesis theobromine sodiosalicylate was administered to infants in whom previously there had been a marked and persistent increase in the circumference of the head notwithstanding repeated rachicenteses. The dosage given was 0.2 of a gramme three times a day continued over a considerable period of time. In several cases of which the history was presented to the society, a cessation of the increase in the circumference of the head occurred on the administration of this drug. When the drug was stopped for a time an increase in the head measurement again set in, but when the use of the drug was resumed a decrease was again recorded. This method is worthy of trial since it is innocuous. In certain of these cases there is in time a tendency to spontaneous recovery, so that if the patients can be carried along for a year or two they may make eventually a good recovery. Dr. Gerstenberger of Cleveland, and Dr. Blackfan of Boston, both corroborated these results. It would appear to be well worth trying in early cases of hydrocephalus of the communicating type.

RECENT WORK ON SCARLET FEVER

THE interest of the whole medical world has been aroused by the recent additions to our knowledge of scarlet fever. The demonstration that the disease is really due to several strains of haemolytic streptococci, and the various deductions which have followed this conclusion have altered our whole mental picture of the disease. The modern conception of scarlet fever is

of a local streptococcus infection, usually of the throat, but occasionally of wounds, burns, or the puerperal uterus, accompanied by certain characteristic symptoms due to toxic absorption, and in spite of the antitoxic immunity which has been produced in the patient followed by later complications due to the direct invasion of the tissues by streptococci. The symptoms due to toxins are the initial vomiting, the five-day fever and tachycardia, the characteristic eruption and desquamation with the nervous symptoms and the joint pains; all these symptoms have been reproduced by the injection of toxins isolated from the cultures of scarlet fever streptococci.

The later complications due to the direct invasion of the tissues by the organisms are the suppurative cervical adenitis, the otitis, endocarditis, pyaemia and acute haemorrhagic nephritis.

It has been shown that an antitoxin is produced in the body of the patient which causes a lasting antitoxin immunity but is not bactericidal and apparently does not prevent the later effects of the disease. The prolonged existence of the streptococci in the throat causes the late complications and the persistent infectivity, especially in those patients with suppurative lesions.

Practical interest, however, centres in the aids to diagnosis, prevention, and treatment which may be obtained from the discovery of the cause of the disease. These are already numerous and varied. There is the Schultz-Charlton extinction test due to the action on the eruption of antitoxic sera; the Dick reaction following an intracutaneous injection of toxin, enabling us to recognize susceptibility to the disease; the possibility of inducing immunity by repeated doses of the toxins; and the development of various antitoxic sera for treatment and passive immunization.

The recent discoveries also reopen the whole question of streptococcus infection. The demonstration of the formation of toxin and antitoxin by scarlet fever streptococci leads to the hope of an early identification of these bodies in the case of erysipelas and other diseases.

Under the circumstances the timely series of articles published in this issue by leading Toronto specialists, detailing recent observations on various phases of scarlet fever should prove of interest to all practitioners.

H. B. CUSHING

ON RESUSCITATION AFTER FAILURE OF RESPIRATION

AT the last annual meeting of the American Medical Association both Professor Yandel Henderson, of New Haven, and Mr. Wills Maclachlan, of Toronto, read papers on the best methods of resuscitation to be employed on persons stricken by electrical shock, and in all cases of respiratory failure due to other causes. In speaking in reference to the character and severity of an electrical shock Maclachlan stated that if an electrical current flows from foot to foot practically no effect will be noticed. If, however, it flows from hand to hand serious results will ensue. In other words, if the path of the current passes through the thorax a severe shock will occur. If the parts of the body that are in contact with the conductors are dry a less severe shock will be felt than if the contacts are wet; severe shocks and even fatalities from comparatively low voltages may occur in bathrooms when the conductors or the body may be wet. In low voltage shocks the effect on the individual is usually due to fibrillation of the heart. In higher voltage shocks, paresis of the respiratory centre occurs. Various methods of resuscitation have been put forward. In America, the Sylvestor method

was chiefly used until Dr. Schaefer described his method in his Harvey lecture in 1909. Since then several important committees have investigated the various mechanical and manual methods of resuscitation, and all have uniformly recommended the prone pressure method. It is, moreover, the easiest method to perform, and the least fatiguing, and can be performed by one person without assistance. Recently the American National Electric Light Association has standardized this prone pressure method, and have had many thousands of its employees trained in it and required to practise it regularly. The men have instructions that the method should be begun promptly and continued for several hours until the patient breathes or until the onset of rigor mortis. Professor Henderson says that a large proportion of all sudden deaths are due to failure of respiration, and the prevention of even a small fraction of them will amount in the aggregate to the saving of a very large number of lives. The Schaefer manual prone pressure method is undoubtedly preferable to any other method for resuscitation after electric shock, drowning, and other conditions in which complete cessation of breathing occurs. The use of artificial apparatus should be discouraged not only because the simple manual method is more effective but also because mechanical devices may injure the structure of the lungs. It is extremely important that the medical profession should be thoroughly acquainted with the prone pressure method, and should realize the importance of applying it immediately in all cases in which respiration has been stopped by any accident. It has been charged against the medical profession that in cases of drowning and electric shock lives have been lost because the physician who happened first to reach the case was unacquainted with this method. In some cases the electric lineman or policeman or boy scout who was administering the prone pressure method effectively has been told to desist, and the physician has either declared the patient dead, or has called an ambulance and sent him to a hospital where he arrived dead. The essentials of any plan of artificial respiration are that it should be applied without the loss of a moment, without waiting to telephone or send for apparatus; and that even if the patient is at first pulseless and apparently dead it should be continued for at least three hours if spontaneous breathing does not return before that time. Professor Henderson in his paper also called attention to the fact that ethical and economic conditions often obstruct greatly needed investigation. The scientific men who have served on the four successive commissions on resuscitation appointed during the last decade, have not only saved hundreds, or more probably thousands of lives, but also millions of dollars to commercial companies which otherwise would have had to be paid in compensatory claims. These commissions have cost the immensely wealthy electrical industry comparatively nothing and they have made no return to the scientific bodies who have made the investigations.

THE PRONE PRESSURE (SCHÄFER) METHOD OF RESUSCITATION

If the mouth is tight shut, no time should be lost in attempts to remove dental plates or other foreign body, but resuscitation should be immediately begun. The patient will breathe through the nose, and, after resuscitation has been carried on a short time, the jaws will probably relax and any foreign substance in the mouth can then be removed. No time should be taken to loosen the patient's clothing as *every moment of delay is serious.*

The patient should be laid on the abdomen, one arm extended directly overhead, the other arm bent at the elbow, and with the face resting on the hand or the forearm so that the nose and mouth are free for breathing (Fig. 1).

FIG. 1.—HANDS IN POSITION

The resuscitator should kneel, straddling the patient's hips with the knees just below the patient's hip bones or the opening of the trousers' pockets. The palms of the hands should be placed on the small of the back with the fingers resting on the ribs, the little

finger just touching the lowest rib, the thumb alongside the fingers, the tips of the fingers just out of sight (Fig. 1).

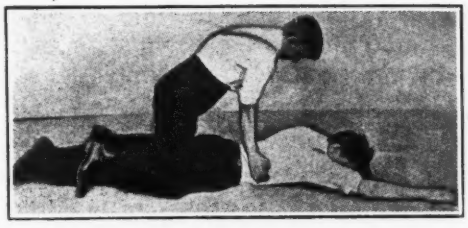

FIG. 2.—PRESSURE ON.

With the arms held straight, the resuscitator should swing forward slowly so that the weight of his body is gradually brought to bear on the subject (Fig. 2). This operation, which should take from two to three seconds, must not be violent, as internal organs may be injured. The lower part of the chest and also the abdomen are thus compressed, and the air is forced out of the lungs; the diaphragm is kept in natural motion; other organs are massaged, and the circulation of the blood is accelerated .

Now the resuscitator should immediately swing backward, so as completely to remove the pressure,

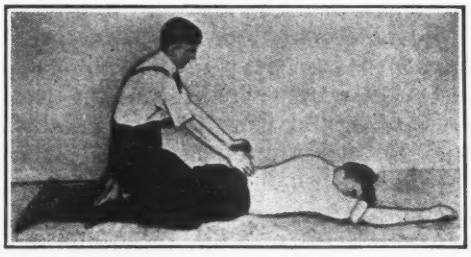

FIG. 3.—PRESSURE OFF

thus returning to the position shown in Figure 3. Through elasticity, the chest wall expands and, the pressure being removed, the diaphragm descends, and the lungs are thus supplied with fresh air.

After two seconds, the resuscitator should swing forward again. Thus the double movement of compression and release should be deliberately repeated from twelve to fifteen times a minute, a complete respiration being made in four or five seconds. If a watch or a clock is not visible, the natural rate of the resuscitator's own deep breathing should be followed. The proper rate may be determined by counting—swinging forward with each expiration and backward with each inspiration.

ON THE PREVENTION OF RESPIRATORY FAILURE

THE above prone pressure method is unquestionably our best present method of resuscitation after electrical shock or drowning accidents, but Professor Yandell Henderson in his address before the American Medical Association, called particular attention to the value of the inhalation of a small percentage of carbon dioxide in combination with oxygen in all conditions in which death from respiratory failure is threatening. He emphasized the fact that the stimulant which nature herself uses to maintain the action of the breathing centre is carbon dioxide. It is the increased production of carbon dioxide during muscular exercise that causes the corresponding increase in the rapidity and in the volume of air inhaled, and by so doing increases the supply of oxygen to meet the increased need. Pure oxygen, or air enriched with oxygen when absorbed by the blood gives life to the tissues, but it is not a stimulant to the respiratory centre and under some conditions may act as a direct depressant. When a man is exposed to a deficiency of oxygen his breathing becomes augmented and with this augmentation more carbon dioxide is exhaled than the body often can afford to lose. Then if oxygen is freely supplied, a marked decrease in the respiratory act occurs and breathing may even stop entirely owing to the lack of stimulus induced by the deficiency of carbon dioxide in the blood. This deficiency will be overcome spontaneously as the carbon dioxide is produced in the body and reaccumulates in the blood, but this may require a long period and while the deficiency of carbon dioxide lasts it profoundly disturbs the acid-alkali balance in the blood. When consciousness becomes impaired in such a condition the inhalation of oxygen alone is not sufficient, and for purposes of resuscitation oxygen containing 5 per cent of carbon dioxide is required. It is this mixture of the two which is specially demanded in carbon monoxide asphyxia (gas poisoning), an accident liable to occur during the winter when the

draughts are checked to prevent too rapid combustion of coal, and in conquence gas escapes into the house, or in rooms when a leak occurs in the illuminating gas pipe. If the inhalation has not taken place for too long a period and the coma is not too profound, resuscitation measures with this mixture may be effectual. This combination is also of value in all conditions in which the respiratory centre is depressed by some volatile poison; also in acute alcoholic intoxication, in morphine poisoning and in similar conditions. The one apparent exception is respiratory distress in pneumonia in which case carbon dioxide should not be added to the oxygen. The important point emphasized by Yandell Henderson is the necessity of using a combination of oxygen with carbon dioxide in failing respiration, the carbon dioxide to stimulate the respiratory centre and thus secure the inhalation of sufficient oxygen to supply the body's wants.

EPIDEMIC DIAPHRAGMATIC PLEURODYNIA "Devil's Grip"

IN 1888, Dr. W. C. Dabney published (*Amer. Jour. of the Medical Sciences*, Nov., 1888) a report of an epidemic which had occurred in the neighbourhood of Charlotteville, Western Virginia, that same year. In some respects it resembled dengue, but Dabney differentiated it both from that disease and from malaria, and considered it to be epidemic but not contagious. Both he and a number of colleagues who had the opportunity of observing many cases, agreed that it was a disease with which they had not previously met. Its chief characteristic appears to have been the agonizing pain suffered by the patient on any attempt to move or draw a deep breath.

The disease does not appear to have attracted attention again until the summer of 1923 when an epidemic occurrence of an acute febrile condition characterized by severe pain in the epigastrium was reported to the state board of health of Virginia by Dr. Maud M. Kelly. A prompt investigation was made, and a report published in which the disease was spoken of as an epidemic, transient, diaphragmatic spasm, of unknown etiology. Sixteen patients suffering from it were admitted to the Presbyterian Hospital, New York, during June and July of that year. The disease excited considerable comment in the daily papers under the name of the "Devil's Grip," and appears to have been very prevalent that season throughout the middle Atlantic States. Dr. Robert G. Torrey, of Philadelphia, has given a description of it in the October issue of the *American Jour. of the Medical Sciences*, 1923. Typically the onset is sudden, often with distinct chill; the temperature is elevated from 102° F. to 104° F., and the pulse may be very rapid especially with any effort to breathe deeply. Pain is the main symptom occurring both in the epigastrium and in the back, and is greatly aggravated by movement of all kinds. With the pain there is marked tenderness which may persist after the pain has disappeared. Frontal headache is a usual symptom, and may be severe and persistent. Profuse sweating is characteristic. There are no signs of lung involvement; pleural friction has not been heard; knee jerks are diminished during the acute stage of the disease. The prognosis appears to be good and no fatalities have been reported. Dr. Small, of the bacteriological laboratory at Philadelphia, considers it probable that the disease is caused by a protozoan organism rather than by a bacterium. His reasons are stated as follows: an absence of leucocytosis dur-

ing the height of fever; the sudden decline of fever with cyclic recurrences; the absence of inflammatory foci; and the increase of eosinophiles, most marked during convalescence. He describes the appearance of smear preparations taken at frequent intervals during two days at the height of the disease. These smears were stained with Wright's stain, and showed inclusions within the erythrocytes which careful study led the observers to believe were protozoa. They describe as seeing within certain erythrocytes small round or oval bodies usually located eccentrically. These were stained a brilliant blue throughout, sometimes with a single red chromatine granule. Little internal detail in the earlier smears could be distinguished. A smear taken a few hours later showed these round or oval bodies distinctly larger, occupying roughly a fifth to a third of the enclosing erythrocyte. In smears taken a few hours later still, the organisms appear to have further increased in size and to have a more definite arrangement of the inner blue mass, with a narrow, clear, faintly blue-tinged outer zone. It is believed that these different appearances indicate different stages in the cycle development of a parasite bearing a striking resemblance to the developmental cycle of the malaria parasite. The organism is considered to belong to the protozoa, but differs from the malaria group in its staining character, in its morphology, and in its lack of a destructive action on the contiguous portion of the erythrocyte enclosing it. The disease seems to occur only during the summer months, but as yet the mode of transmission of the infection has not been found.

THE ETIOLOGY OF RICKETS

FOR some years the attention of paediatrists all over the world has been intensively directed to the subject of rickets, its explanation, prevention and cure. Recently published experiments from the laboratories of the Paediatric Department of Yale University* suggest a startlingly new idea of the disease and afford wide scope for investigation.

Investigations in various places have shown that rickets and tetany are due to a disturbed metabolism of calcium and phosphorus, and that this is due to lack of sunlight, proper hygiene, diet and exercise. The disease can be cured by exposure to sunlight or to ultra-violet rays from other sources, such as the alpine lamp, and also by certain food substances, especially cod liver oil and yolk of egg. It has been recognized that these latter agents seem to be a provision of nature to take the place of sunlight for certain actively growing organisms which are deprived of the influence of the sun, such as fish in the depths of the sea, and the embryo chicks which are being incubated. It has now been demonstrated that these anti-rachitic agents are actually radio-active and emit ultra-violet rays when oxidized. Apparently ultra-violet rays are as necessary to certain phases of metabolism in higher organisms, as sunlight is to plants, and solar energy exerts a hitherto neglected function in the physiology of all animals.

The suggestion is then that rickets is not due to lack of vitamins but to lack of certain light rays which may be supplied by various means. H. B. CUSHING

*KUGELMASS, I. N. AND MCQUARRIE, I., The Photo-Activity of Substances Curative of Rickets, *Science*, Sept. 19th, 1924.

ANHYDRAEMIA IN YOUNG INFANTS

IN a recent editorial in the *Journal of the American Medical Association*, attention is called to an article by McKim Marriott,[1] of Washington University, on "Severe Anhydraemia" liable to occur in infants during the first few days of life due to the fact that they have a high water requirement which must be filled. Newly born infants nursing at the breast and receiving no fluid from other sources are liable to lose weight and become to some extent dessicated, owing to an insufficient water intake; also in any infant the presence of infection is likely to lead to refusal of food, with vomiting and diarrhoea and a resulting anhydraemia. When the blood and tissues become concentrated by water loss, the amount of water available for evaporation is diminished and ultimately becomes less than that required for the removal of the heat of metabolism, and fever occurs, and while some writers are unwilling to assign this anhydremia as the sole cause of the high temperature many cases are reported in which this febrile temperature can be lowered readily by the administration of water.

In a recent paper by Bakwin, Morison and Southworth,[2] of Cornell University, it is stated that while the protein concentration of blood serum is fairly constant in new born infants, usually lying between 6 and 7% in a new born with fever the serum proteins are generally above 7.5 and often over 9%, indicating a marked diminution of plasma water. When fluid was given orally, usually by gavage, in the proportion of 30—40 c.c. per kilogram of body weight, a prompt fall in temperature and blood concentration followed with great regularity. When the fluid was given hypodermically or intraperitoneally the effect on the temperature and blood concentration was neither so marked nor so prompt as after water given by the mouth. The greater advantages in the oral administration of water deserves emphasis at a time when all sorts of parentoral routes are chosen for the introduction of remedial agents into the body. These writers state that even in older infants dehydrated as the result of severe diarrhoea, fluid by mouth was more effective in reducing the concentration of the blood than fluid given in other ways.

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A NEW REVISION OF THE UNITED STATES PHARMACOPOEIA

IN 1914 the last revision of the British Pharmacopoeia was made. This revision was seriously criticized at the time, especially by teachers of pharmacology whose duty it is to see that before a student is licensed to practise he shall have an adequate idea of the drug stuffs which he will employ. In this last revision some forty-four different drugs, with all their accompanying preparations were deleted, and some dozen important drugs were added to the list. In addition to these changes, however, a number of drugs mainly used in India and other of the overseas Dominions were added, with the intention and hope that by so doing the Pharmacopoeia would be made more representative of medical needs throughout the Empire.

The United States Pharmacopoeia is revised every ten years. The ninth revision was published in 1916, and the tenth revision is nearly completed and

will probably be available early in 1925. This revision has very considerably decreased the number of drugs contained in the last; the number deleted being about 170. Some forty new drugs will be added, if one may judge from the advanced notices which have appeared in recent medical and pharmaceutical magazines. As the responsibility for the scope of the new Pharmacopoeia has been placed almost entirely upon the physicians, there is a great probability that all drugs of commercial interest only to the pharmaceutical profession will be deleted. The ninth edition took a very definite step forward in directing steps to be taken for the pharmacological standardization of a few drugs. Of these digitalis and pituitary extracts were the most important, as their therapeutic value is liable to much variation and can only be estimated by the physician when standardized. Steps are being taken in the present revision of the Pharmacopoeia to increase the number of the standardized drugs and to improve the methods. The profession in the United States will thus be assured of the standardized strength and purity of their more important drugs and preparations.

As there still are, however, in both Pharmacopoeias a number of drugs of little importance, the study of which is confusing to the student and useless to the practitioner it would, in our opinion, be wise for a new principle to be introduced and a division made between the really important drugs, which every physician should know, and those which are only in local use, and of questionable therapeutic value, while those useful as mere flavourings or excipients might form a third division. In this way the Pharmacopoeia would be made more practical and more useful to the general practitioner.

In Canada the British Pharmacopoeia is our legal authority, save in those exceptional cases which arise under the Food and Drug Act where the vendor indicates that the standards have been those of another pharmacopoeia, usually that of the United States. As a considerable number of the medicinal preparations employed in this country are manufactured in the United States, and as we are liable to suffer because the British Pharmacopoeia recognizes no definite pharmacological standard, the profession in Canada has recently endeavored to persuade the government to undertake the standardization of all such pharmaceuticals as may appear to require it. It is with this end that a new Committee on Pharmacy has been appointed by the Canadian Medical Association. We trust this committee will use every effort to secure the standardization not only of such drugs as have been standardized in the United States Pharmacopoeia but of all other drugs in which standardization may be necessary to establish a definite value of strength.

V. E. HENDERSON

Editorial Comments

STUDIES OF ANAEMIA IN INFANCY AND CHILDHOOD

Dr. J. P. Crozier Griffith, of Philadelphia, at the last meeting of the American Pediatric Society read a paper on "Clinical Studies of some Diseases of the Blood in Children." He said that the statement has been made that chlorosis almost never occurs in children and an estimable work on medicine has stated that it is rare under twelve years of age. Naturally, an early age prevents the appearance and recognition of some of the general symptoms described as characteristic of this disease, but so far as the blood picture is concerned the condition which certain infants and young chil-

dren exhibit cannot be distinguished from that on which the diagnosis of the disease in adults is based. This form of anaemia is particularly susceptible to improvement from the administration of iron, and a rapid increase in the hemoglobin content of the blood can be expected as in the chlorosis of adults. The anaemias of infancy and early childhood present a kaleidoscopic picture, with changes in the blood picture from one time to another, so that it is very difficult to make a diagnosis. It is almost always necessary to have the differential count, and even a differential count often leaves one in doubt if one depends on that alone.

At the same meeting, Dr. John Lovett Morse, of Boston, called attention to functional diastolic murmurs heard in the aortic area, and pistol shot sounds sometimes heard in the groin during infancy and childhood. Dr. Morse stated that these aortic murmurs were heard not infrequently in association with severe anaemias in infancy and early childhood and were not only audible in the aortic area but were transmitted in the same way as was the murmur of organic aortic insufficiency. The murmur may or may not be associated with enlargement of the heart and is presumably simply one of the manifestations of the lowered muscular and nervous tone producing a relative insufficiency of the aorta from dilatation. A pistol shot sound in the groin is relatively common in moderate and severe cases of anaemia in early life, being more common in infancy than later. It is usually associated with an increase in the pulse pressure and occasionally with a double murmur—Durozier's sign. These manifestations are not evidences of a lesion at the aortic orifice, although they are sometimes accompanied by a diastolic murmur in the aortic area. Proof of this statement lies in the fact that they vary with the intensity of the anaemia, and disappear entirely when the anaemia is cured. They may occasionally be heard in other conditions in childhood that are accompanied by a lowered vasomotor tone, such as pneumonia and typhoid fever. The only importance of these physical signs is that they are sometimes thought to be evidences of organic disease at the aortic orifice and, are consequently, the cause of mistakes in both diagnosis and prognosis.

PERIODICAL MEDICAL EXAMINATIONS

Health examinations periodically conducted are receiving more and more attention by the medical profession through the state and county medical societies. The Pennsylvania Medical Society announces as a prominent part of its annual meeting in the fall, that the personal examination of a hundred physicians attending the meeting is to be made as a demonstration. King's County, Brooklyn, Medical Society, has just finished a report* on the physical examination of ninety-one members of its society, which has been submitted to the public health committee. We note that almost every deviation from normal was encountered. Contrary to the usual experience hypotension was frequent, possibly because physicians were not nervous when their blood pressure was taken. Despite irregular hours of work, deviation from routine as to meals and sleep, and less systematic exercise and recreation than is usually considered advisable, the fact that physicians rate better in health than other corresponding age groups would seem to indicate that subconsciously, at least, physicians practise what they preach and were in better general condition than other groups of men in the community; although we may remark that one-third of the number might well practise "girth control." It is evident that in making these health examinations not only time and skill, but a discriminating judgment is demanded to interpret rightly the significance of the various findings in relation to habits of living; and to give suitable advice.

*RICHARDSON, ANNA M., A Report on the Physical Examination of Ninety-One Members of the Medical Society of the County of Kings.

RAPID REPRODUCTION OF RATS

We read occasionally of campaigns to reduce the number of rats, but when one learns the estimates that have been made on the possibilities in rat reproduction one marvels that such campaigns are not more necessary. In 1909 Lantz estimated that rats breed three times a year and the average litter is ten. At this rate without deaths the increase from one pair would amount to over twenty millions at the end of three years. In 1917 Lantz altered his

estimate to six litters a year with ten as the average sized litter. The most complete figures, however, are those of Hinton who began with a basis of six litters of eight rats in a year and who figured that young rats breed when four months old. He concluded that 50% of the young die at birth, and that 50% of the remainder die before reaching breeding age, and that only 50% of those remaining could breed. Nevertheless the number resulting from the breeding of those remaining will yield billions and billions of rats in ten years. Silver*, however, points out that the normal mortality of rats must be almost as great as their normal reproduction, and that apparently increased reproduction is promptly cut down by increased destructive methods. Evidence exists, however, that at various times there would be startling increases in the number of rats in some communities where the high reproductive power when undisturbed becomes an immediate menace. When we consider the facts now known as to the relationship of the rat to the carrying of disease, sound reasons for constant alertness exist to control undue development of this troublesome species.

*Silver, I., The Reproductive Potential of Rats, *Jour. Mammology*, v, 66, Feb., 1924.

ON THE ORIGIN OF BILIRUBIN

It has long been considered that the presence of the bilirubin in the blood serum and in the urine was an unmistakable evidence of some hepatic disorder, and on this seemingly well founded assumption the value of the diagnostic tests for bile pigment in the urine has been based. Protracted efforts to test the accuracy of this hypothesis were made by Whipple and his collaborators.[1] Animals in whom the portal blood was diverted from the liver were found to develop icterus in the same way as normal dogs did under similar conditions; even when the blood supply to the liver was completely excluded by ligation of the hepatic artery, jaundice still appeared. From their experiments the authors concluded that the liver could not be the exclusive factor in the conversion of haemoglobin to bilirubin. Quite recently Mann and his co-workers[2] have succeeded in removing the liver completely from animals and keeping them alive for many hours. Under such conditions a yellow pigment giving a positive test for bilirubin accumulates progressively in the urine, blood plasma and fatty tissues. The amount found is too large to have come from any stored pigment or from the gastro-intestinal tract. The pigment appears even when both liver and spleen have been removed, indicating that the latter organ is also not necessary for its formation. Furthermore, jaundice occurs when no blood is present in the peritoneal or any other serous cavity so the cells lining these spaces are likewise not essential to the pigment elaboration. It is difficult, therefore, to escape the conclusion that the pigment bilirubin so characteristic of bile can be formed without the intervention of the liver, and the Rochester physiologists are of the opinion that there is only one possible source of bilirubin, namely, the haemoglobin. The logical site for the destruction of the worn-out functionless erythrocytes and for the disintegration of haemoglobin according to Mann is the place where the greatest functional stress is placed on the erythrocytes, that is, in the capillaries. This, however, is speculation; this fact, however, remains demonstrated, that the liver is not indispensable for the formation of the bile pigment, and must be considered to some extent at least as only an excretory organ for it.

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(1) Whipple, G. H., and Hooper, C. W., *J. Exper. Med.*, xvii, 593, 612, 1913. (2) Mann, F. C.; Bollman, J. L., and Magrath, T. B., Studies on the Physiology of the Liver, IX. The Formation of Bile Pigment After Total Removal of the Liver, *Am. J. Physiol*, lxix, 393, July, 1924.

A university extension course of lectures in social hygiene will be delivered during the coming winter throughout Ontario under the auspices of the Canadian Social Hygiene Council. In them an attempt will be made, not only to deal with conditions under which life is lived, but to aim at the prevention, not merely the cure of evils. Among the speakers will be the Honorable Mr. Justice Riddell on "The Aims and Objects of the Canadian Social Hygiene Council." Dr. Gordon Bates on "What Social Hygiene Means." Dr. Heagerty on "Educating the Public in Social Hygiene." Dr. Porter on "Personal Hygiene." The Rev.

Ronald McLeod on "The Church as a Community Centre." Prof. Dale on "What Social Hygiene Stands For." Dr. Hincks on "The Relationship Between Mental and Social Hygiene." Judge Coatsworth on "Prevention of Crime." Dr. T. C. Routley on "The Doctor and the Public" and Mr. Chambers on "Recreation Facilities." We commend the course to the profession and trust that they will make use of their influence in furthering its objects.

The Canadian Nurse, a professional magazine owned and published by the Canadian Nurses' Association, has appeared in a new costume since its offices have been moved to Winnipeg. This has always been a useful magazine but the October number, with its many changes in makeup, gives promise of rating among the best professional magazines published in this country or elsewhere. *The Canadian Nurse* is published at 609 Boyd Building, Winnipeg, and issued monthly for $2.00 a year.

ERRATA

DR. LOCKWOOD'S ARTICLE ON ACUTE AND CHRONIC EMPYEMA

We regret that in passing through the press an important error was made in Dr. Lockwood's article on "Empyema, acute and chronic", which appeared in the last issue. In the last line before the summary on page 913 there appears the following:—"and return the patient to health with but little morbidity and with a mortality of not more than ten per cent."

Dr. Lockwood writes us that this should read:—"and with a mortality of not more than one per cent."

This figure we understand, was a point in dispute at the meeting in Ottawa. Professor Archibald considered that one per cent was unduly low and that there must be some mistake. Dr. Lockwood writes us that he has sent questionnaires to a large number of men doing thoracic work in this country and Europe, and that several of them reported as many as 300 or 400 chronic empyemas without a single death.

Dr. Archibald has been communicated with, and desires us to point out the essential difference, as regards the mortality rate, between cases of chronic empyema and those of acute empyema. The latter, to judge from the figures given by large clinics, can never in any large series be operated on with so low a mortality as 1%. Chronic empyema is a totally different problem.

Habitual Hyperthermia during Recovery from Scarlet Fever.—Heinrich Finkelstein, Berlin, Germany, has investigated scarlet fever convalescents and was struck by the fact that a very large number of scarlet fever convalescents showed temperature elevations beginning in the third or fourth week after the scarlet fever itself had subsided, and persisting for many weeks. Neither tuberculosis nor inflammatory sequelae were found in spite of the most careful examination. The condition was present even after very mild scarlet fever that had been characterized only by fever and eruption. Finkelstein is of the opinion that this habitual hyperthermia of scarlet fever convalescents may be attributed to a balance disturbance in the autonomic nervous system or in the heat regulating centre. There is, then, a neurosis. Sympathicus stimulation removes the fever; vagus stimulation increases the fever, and vagus inhibition has no effect, thus suggesting a relative vagotonia due to weakness of the sympathetic nervous system. Next, Finkelstein tested pharmacologically the autonomic nervous system of fifteen children during and shortly after the acute stage of scarlet fever, to determine whether scarlet fever goes hand in hand with a change of the nervous system in the sense of a vagotonia. The findings lead to the conclusion that scarlet fever apparently affects the autonomic nervous system in the sense of a vagotonia, and that, in many cases, it leaves the patient for many weeks with a vegetative neurosis characterized by habitual hyperthermia. The experience that, in a few cases, a single injection of epinephrin removed the hyperthermia holds out the hope that an effective method of treatment will be found.—*Jour. Am. Med. Ass.*, Aug. 23, 1924.

XUM

Abstracts from Current Literature

MEDICINE

Nephritis in Children. Marriott, W. McK. *Medical Clinics of North America,* March, 1924.

Intoxications Associated with Alterations in the Physico-Chemical Equilibria of the Body Cells and Fluids. Acute Bright's Disease. Marriott, W. McK. and Clausen, S. W. Transactions of the American Pediatric Society, 1923.

In the first of these two articles Dr. Marriott presents two cases of nephritis in children. The first case corresponds to the type known as "Acute Bright's Disease" in which there is present marked œdema, with a diminution in the amount of urine. Aside from the kidney findings, the interesting point in the physical examination, was the presence of a chronic tonsillitis and sinusitis. The examination of the urine showed a large quantity of albumen with casts, and a small output of highly coloured urine of a high specific gravity. The kidney function as determined by phthalein and the blood urea was normal. There was no increase in the blood pressure.

The interesting points brought out in the two papers are the relation of infection to nephritis of this kind, particularly accessory nasal sinus infection, and the changes found in the surface tension of the blood, in the presence of this type of œdema, as determined by Dr. Clausen. In a series of twenty cases of nephritis of this kind pure cultures of a staphylococcus were obtained from some one of the accessory sinuses, and on removal of the infection by appropriate surgical means the œdema was relieved. It is suggested that some infection, not necessarily sinus in location, is the cause of the disturbance, and that the kidney condition is not really a nephritis, since no kidney inflammation is present, and the kidney can show complete functional and anatomical regeneration. The term "nephrosis" is suggested. Dr. Clausen found that in this particular type of kidney disturbance the surface tension of the blood serum is always lowered; that is, the colloidal osmotic pressure of the blood is so altered that the body fluids instead of passing from the tissues into the blood stream and then to the kidney are retained in the tissues, causing the œdema and diminished urinary excretion. As the œdema disappeared, following the removal of the infection, it was noted that the surface tension returned to normal; in lethal cases the surface tension became progressively lower. A surface tension active substance was isolated from the urine and blood of cases of this type of nephritis only, and not from cases with œdema due to other causes. The authors suggest that this substance, which alters surface tension, is one of the products of altered metabolism due to infection—but is not a product of the infecting organisms themselves.

The second case presented is one of the type showing little or no œdema, large quantities of blood in the urine, a retention of non-protein nitrogen in the blood and diminished phthalein excretion, and is commonly called "acute hæmorrhagic nephritis." It is also called acute glomerular nephritis, as differentiating it from the acute tubular nephritis described above. The cause of this type of kidney inflammation is usually an infection, frequently tonsillar in origin, but the infecting organism is a streptococcus. In mild cases removal of the infection clears up the condition, but in others permanent damage is left both to kidneys and systemic capillaries, resulting in chronic nephritis with hypertension.

The treatment suggested is obvious: in the first type, remove the focus of infection and allow a liberal diet; in the second, remove the focus of infection and give a low protein diet of milk and cereals. R. R. STRUTHERS

The Mechanism of Angina Pectoris. Reid, W. D. *Archives of Internal Medicine,* August 15th, 1924.

The author begins his article by drawing attention to the fact that, though angina pectoris has been carefully studied by many observers, the exact condition of the heart, or the sequence of events occurring during an attack is still unknown. He reminds us that the attack usually follows closely on exertion, phy-

sical or mental. With cessation of all exertion the attack comes to an end; the quick-acting vasodilators commonly bring relief.

He refers to the three leading theories of the cause of angina pectoris.

1.—*Coronary.*—(a) Sclerosis of the coronary arteries. First brought forward by Parry and Jenner in 1799. However, owing to sclerosis of the coronary arteries being frequently found at post-mortem in cases in which angina pectoris had not occurred, and also other cases where angina had occurred, and necropsy revealed no coronary sclerosis, this explanation has been largely abandoned.

(b) Claudication of coronary arteries, causing a deficiency of blood supply to the myocardium. This theory is the one generally held by those who believe the cause of angina pectoris is to be found in the coronary arteries. Reid states that he has been unable to find any real proof of the existence of the phenomenon of claudication in the arteries of the heart, in spite of an extensive search of the literature.

2.—*Aortic.*—This theory is held by Allbutt and also Wenkebach. The angina pectoris is thought by them to be due to irritation of the nerve end plates in the first part of the aorta, by the plaques of an aortitis, and is especially liable to occur in conditions causing a rise of intra-arterial pressure and subsequent stretching of the investing membranes of the root of the aorta.

3.—*Myocardial Fatigue.*—This is essentially the theory held by Mackenzie.

In regard to pathological findings, the author considers that it is no more possible to pick out just what lesion is associated with angina pectoris than it is to determine, on the necropsy table, the cause of premature beats which may have been noted by the clinician. He suggests that the solution be sought in a study of physiology both normal and pathological. His theory is that in the circulatory adaptation to exercise there is a dilatation of the peripheral stream bed, and that this is brought about by the co-operation of the nervous system, probably by a reflex through the depressor nerve fibres of the vagus. This acts as a protective mechanism, as it permits the heart to contract without strain. A failure of this reflex dilatation of the peripheral arteries is suggested as the essential feature of angina pectoris. The dilatation of the peripheral stream bed causes a more rapid drainage of blood away from the heart, and lessens the rise of pressure in the first part of the aorta and also the height of that which must be achieved in the left ventricle before the aortic valve can be forced open. The heart is thereby enabled to contract without strain.

In the three types of heart disease with which the clinical syndrome, angina pectoris, is prone to be associated, namely arteriosclerosis, cardiovascular syphilis, and chronic hypertensive conditions, there are pathological changes in the first part of the aorta and the ventricular muscle, or changes in the peripheral blood vessels, or both, which may make abnormal the conditions occurring in the circulation when exertion is undertaken.

Reid considers the sequence of events in angina pectoris may well be a failure of the reflex dilatation of the peripheral blood vessels, which leads to a sudden rise in the pressure in the first part of the aorta and the cavity of the left ventricle. This heightened pressure in turn irritates the local nerve and plates which respond by pain referred to the arm, shoulder, etc. In short, he suggests that the essential feature of angina pectoris is a failure of the protective mechanism of reflex dilatation of the peripheral blood vessels. L. C. MONTGOMERY

The Myocardial Lesions of Diphtheria. Warthin, A. S. *The Jour. of Inf. Diseases*, July, 1924.

There has been great divergence of opinion as to the degree of injury to which diphtheria gives rise in the cardiac muscle, even whilst it is generally admitted that the heart is affected to some extent in a very large proportion of cases. The writer reviews the literature for the last sixty years, in detail, and points out the various conceptions which have existed regarding the condition; these include cardiac paralysis, cardiac thrombosis, infectious endocarditis, infectious myocarditis, injury to cardiac nerves and ganglia, and special affinity of the diphtheritic toxin for the bundle of His. It is significant in any case, that whilst with our improved methods of treatment, the frequency of death from obstruction of the respiratory tract has diminished, heart failure has become proportionately much more often the form of death.

Dr. Warthin points out that our knowledge of the actual lesions in the heart muscle has been greatly influenced by theory rather than scientific observation. There has been a tendency to ignore the pathological evidence collected, and even when recognized it has been incorrectly interpreted. Some hold that the fatty degeneration, cloudy swelling, and other pathological changes are the essential lesions of the heart muscle or its conducting system; others say that these changes are secondary in nature.

Warthin gives details of the post-mortem study of sixteen cases of diphtheria. All of these patients had died from cardiac failure, and all had shown disturbances of the heart function clinically. In no case was there any endocarditis, and in only one was there a mural thrombus, which occurred over an area of severely necrosed myocardium. All showed a marked parenchymatous degeneration of the heart muscle varying in degree with the severity of the process and the stage of duration. The pathological changes are described in detail.

There was evidence of muscle regeneration in three of the cases, of two, three and four weeks' duration, respectively. In the case of longest duration six weeks, there was apparently no such evidence, but there had been an extremely severe diphtheritic paralysis of all the voluntary muscles. Whether the newly formed connective tissue persists as localized fibrosis or whether it serves only as a "congenial environment" for the development of new muscle fibres, is a point still to be decided. In his opinion it is possible that complete regeneration without fibrosis occurs in the less severely damaged hearts; in the more severe cases fibrosis and impairment of cardiac function are a probability, although clinical experience shows that considerable myocardial injury may be recovered from so as to leave no trace in the functioning of the heart. The specimens examined gave no evidence of any special affinity of the toxin for the bundle of His. H. E. M.

Some Observations on the Treatment of the Psychoneuroses. Wright, G. J. *Amer. Jour. Psychiatry*, April, 1924.

Out of 100 consecutive ambulant cases seen in his office Dr. Wright finds on the average thirty-five organic cases, fourteen epileptics, thirteen psychopathics, six endocrinopathics, six unclassified types and twenty-six psychoneurotics.

Of the twenty-six psychoneurotics Dr. Wright would classify eighteen as mild or benign and eight as severe or pernicious. As a rule he regards patients showing symptoms of neurasthenia, of anxiety-neurosis, anxiety-hysteria, and of the simple depressions, as in the benign group, while patients in the so-called psychasthenic or compulsion-neurosis, group in whom the difficulties of cure are so great, he thinks should be regarded as of a pernicious character. The possibility of cure, he finds, depends upon the easy accessibility of the causes of the disorders and the degree of their fixation and the nature of the sub-soil or background. He lays stress upon not overlooking somatic disease, especially lues and encephalitis, also cardio-renal disease, malignant disease of the viscera and focal infections.

In studying his patients he states that he has found the so-called Freudian technique unnecessary in the majority of cases. But in the same paragraph he writes, "the so-called foreconscious and sub-conscious are admittedly accessible." It is plain that if Dr. Wright reaches the sub-conscious mental level in the majority of his patients, as he probably does more or less, it is difficult to make out how he can dispense with Freudian technique. His main object, however, he may attain, which is a thorough understanding of the personality of the patient. The more accessible the patient, the easier the cure, and vice-versa. The patient must be helped to understand his own mental mechanisms, and shown how to adjust himself to his difficulties. He explains to his patients as far as possible the somatic reactions of the emotions such as fear, anxiety, apprehension, and depression, and the conversion mechanism of hysteria. And he insists that instruction of this kind requires firmness, persistence and repetition.

Adjuvant treatment such as medicine, rest, baths, massage, form a minor part of the treatment, but still have their place. Dr. Wright has practically abandoned the "rest cure." He keeps his patients at their work as far as this is practicable. These principles of treatment, he states, have worked well in the benign cases

and in some of the more co-operative of the malignant or pernicious cases. The admitted failures among the latter are generally the compulsion-neurosis cases. These he has found it advisable to send to specialists in psycho-pathology and psycho-analysis. For his own method, he claims that it is not new, and makes acknowledgement to those who have enunciated the principles of dynamic psychology. He reiterates that it is not Freudian, but confesses that he sends his most difficult patients to specialists using Freudian methods.

In the discussion on the paper the following observation was made. The psychoneurotic patient, even after having comprehended his mental mechanisms may be unable to let go his symptoms on account of inhibitions and unconscious resistances which he is unable to control, and which originate in childhood. The psycho-analytic is the sole method of disposing of these. They cannot be eliminated by advice.

It was pointed out that Dr. Wright's classification of patients did not include psychotic or insane patients, and that some of those classified as "pernicious" probably included early stages of dementia praecox, mild manic-depressive psychoses and paranoid states.

The paper is interesting and practical and should be read by all practitioners interested in psychoneuroses. A. G. MORPHY

Clinical Significance of Hunger Pains. Higgins, Wm. H. *J.A.M.A.*, Feb. 23, 1924.

Haller considered that the hunger mechanism consisted in mechanical stimulation of sensory nerves in the gastric mucosa. Pawlow supported this idea. Boldyreff demonstrated that the fasting stomach of man exhibited two types of contractions. The first type is a tonus rhythm which disappears when the stomach is full, but is always present when the organ is empty. Superimposed on this tonus contraction there occurs, the periodic, powerful rhythmic contractions alternating with periods of relative quiescence. These individual contractions gradually increase in amplitude, and the intervening pauses become shorter, until the climax is reached in a number of very strong and rapid contractions, approaching incomplete tetanus. This condition persists until food is taken into the stomach, when relaxation again occurs and the cycle repeats itself.

In 1911, Cannon and Washburn, by experiments on man, proved that the periods of contractions in the empty stomach are synchronous with the periods of hunger sensations, and that each separate contraction is synchronous with a hunger pang. A year later, Carlson demonstrated that the contractions in an empty stomach give rise to the sensation of hunger by stimulation of sensory nerves, not in the mucosa but in the sub-mucosa or muscularis. When the contractions were greatest, hunger was most acute. The normal individual does not experience a definite hunger pang when the stomach is empty. In ulcer cases contractions are more acutely felt probably because of a hyperexcitability of the gastric nerves due to the inflammatory process. The idea supplants the "acid theory" of the causation of ulcer pain. Hertz has shown that the presence of hydrochloric acid in the stomach is not necessary to the production of hunger pains. Spencer, Myer, Rehfuss and Hawk have demonstrated that the relief due to alkalis is not due to neutralization but to a relaxation of the tetanic spasm of the pylorus and antrum. Hunger pains need not have their origin in the stomach but may arise reflexly from extra gastric foci. This symptom occupies a position of unwarranted importance in the diagnosis of gastric or duodenal ulcer. The author analysed 162 abdominal cases and found that hunger pains were present in 50% of peptic ulcers, 15.4% of chronic cholecystitis and 17.5% of chronic appendicitis cases. The age of the patient, duration of the illness, percentage of hydrochloric acid or roentgenologic studies apparently bore no relation to the incidence of this complaint.

The most frequent cause of hunger pains is a duodenal reflex either through the branches of the vagi or from the absorption of bacterial toxins from a local inflammatory process in the duodenum. The irritation tends to intensify the normal rhythmical contractions and the typical hunger pains are produced.

GEO. A. FLEET

SURGERY

A Method of Herniotomy Utilizing only White Fascia. Andrews, E. *Annals of Surgery*, vol. lxxx, August, 1924, p. 225.

Andrews states that the low percentage of recurrences of hernia given by Bassini, Murray,

Judd, Bull, Coley and others mean nothing because they are not based on proper follow-up methods. Those published by Davis, Erdman and Taylor are more representative of results in America. Bassini's operation for hernia is condemned because its inner row of stitches are in red muscle and not in tendon or white fascia. Evidence is brought forward to show that in practically every recurrence operated upon, the muscle has pulled away from the inguinal ligament. It is doubtful if the muscle ever unites with the ligament. Furthermore the stitches interfere with the nerve supply, causing the inferior fibres to atrophy and so weaken its sphincter action. Thus it is that so many recurrences are direct hernias.

In the method he has adopted and has used with satisfaction since 1918, the canal is opened up in the usual way and the floor cleared of all impedimenta. The sac is isolated and emptied. The index finger inserted into the abdomen underneath the canal to act as a guide for stitching. The red muscles are retracted and the endo-abdominal fascia identified and tightened by a continuous suture from the pubic spine to the internal ring. The sac is now transfixed, ligated and excised. Another stitch is taken in the endo-abdominal fascia leaving a very small hole for the cord. The red muscles are ignored. The upper flap of the external oblique is now sewn with interrupted sutures to the inguinal ligament. The cord is then replaced to its newly formed bed and the lower flap of aponeurosis sutured over it as a roof for the canal. ALBERT ROSS

Jack-Knife Position after Hernia Operations. Watson, L. F. *Annals of Surgery*, August, 1924.

The posture of the patient after an operation for hernia is usually neglected. If surgeons realized that they could reduce their recurrences materially, besides adding to the comfort of their patients, the jack-knife position would become a matter of routine for inguinal, femoral, umbilical and ventral hernias which presented difficulties in closing the fascial layers.

In inguinal hernia operations the best exposure is obtained by keeping the thigh extended until the deep sutures are ready to be tied, when it should be elevated, adducted and rotated inward. This reduces the distance between Poupart's ligament, the internal oblique and conjoined tendon from 25 to 50 per cent, depending on the size of the opening, the variety of hernia, and the development of the muscles. After the patient is returned to bed his knees and shoulders should be elevated 25 to 45 degrees by means of pillows and a back rest. This position takes the strain off the stitches during the process of repair, permits a broad firm union of fascial flaps, and reduces the percentage of recurrences. The jack-knife posture should be maintained as long as the patient stays in bed.

Paraffinoma of the Vas Deferens. Watson, L. F. *J.A.M.A.*, June 14, 1924.

The author reports an unusual complication following the paraffin injection of an inguinal hernia by a charlatan. The hernia promptly recurred and the cord and testicle on the side treated became swollen, painful and tender on pressure. At operation paraffin masses were removed from the internal oblique muscle, the conjoined tendon, and the vas deferens. The vas was occluded and it was necessary to resect it and anastomose the ends.

Because of the high percentage of recurrences following operations for "paraffin hernia" the regular Bassini operation was combined with the author's method of *lateral displacement of the cord.* With the cord displaced on to the internal oblique, one-half inch to the inner side of the deep suture line. The overlapped fascial flaps were securely stitched to the deep suture line to reinforce the weak spots, and the usual points of recurrence; the internal ring, the lower end of the incision over the pubic bone, and the line of deep sutures.

The serious accidents that sometimes follow paraffin injections of hernias are: gangrene of the skin; injection of cord structures; wounding of intestine, appendix, or bladder with the needle; injection into blood vessels, followed by pulmonary or cerebral embolism or sudden blindness from plugging of the artery of the retina, and occlusion of the iliac or femoral artery, with gangrene of the extremity necessitating amputation.

Dangers of Taxis in Strangulated Hernia. Watson, L. F. *International Clinics*, 1924. Vol. II, p. 217.

Taxis is little used at the present time because of its dangers and the fact that there is a much lower mortality rate if operation is performed as soon as the diagnosis is made and without attempts at manual reduction. Contrary to the general opinion, if the hernia cannot be reduced in five minutes by moderate pressure, it is inadvisable to continue taxis longer. Taxis is aided in infants, children and adults by suspending them by their feet, head downward.

Taxis is contraindicated when the hernia has been down several hours; when the onset is acute and the symptoms severe; when previous attempts at taxis have failed; when the hernial coverings are œdematous; when there are symptoms of prostration and shock, and when there are signs of ulceration and gangrene.

If taxis is apparently successful, the patient is not out of danger for several days and should be watched carefully for symptoms of reduction *en masse*, haemorrhage, and delayed perforation of the intestine.

Hernial Tuberculosis.—Watson, L. F. *International Clinics*, 1923, Vol. I, p. 230

The diagnosis of hernial tuberculosis is seldom made except at operation unless lesions exist elsewhere, such as in the abdominal viscera, peritoneum, genital organs, spine, bones, joints, lungs, or meninges. The outlook is ordinarily grave because the patient often dies from the primary lesion. In children a congenital tuberculous hydrocele is often mistaken for a simple hydrocele. If the tuberculous hernial contents are thoroughly exposd to the air, improvement generally follows and sometimes healing of the local condition. Peritoneal tuberculosis is nearly always present also and should be dealt with through a second incision. In addition to the operative treatment, the usual measures employed to combat tuberculosis are necessary.

Germicides for use upon the Skin. McDonald, E. *Am. Jour. of Obs. and Gyn.*, October, 1923.

In 1915 the author recommended the use of the following formula for disinfection of the hands: Alcohol sixty parts, acetone forty parts, and pyxol two parts. This solution possesses the qualities of being a fat solvent and contains a germicide which is not neutralized by the skin or organic matter. Pyxol is a coal tar product with a phenol coefficient of twenty. It is manufactured into an emulsion and is insoluble in water. The action of these emulsion germicides is not fully understood. They do not combine with protein and yet they kill bacteria. Pyxol has none of the poisonous qualities of carbolic acid. It is non-irritating to the hands and is carried to the deeper structures of the skin. This is a distinct advantage, as most of the chemical germicides are neutralized on the surface of the skin by the organic matter present. The hands may be washed in soap and water containing pyxol 1:1000, then follow by washing in McDonald's solution.

It is also used in the skin preparation of patients. The night previous to operation the shaving should be done with water containing pyxol 1:1000. At operation the area is rubbed lightly with McDonald's solution for three minutes. A wet towel is then laid over the area until the operation is commenced. For vaginal operations the patient is given a douche of pyxol 1:2000 the night before operation and the following morning the vagina is washed with soap and water containing pyxol 1:2000.

A comparison is made with the chemical germicides. The latter act by combining in direct chemical combination with the protein of the bacteria and so destroying them. They destroy the tissue cells to some extent and are always neutralized by organic tissue. Certain of the chemical germicides such as iodine and picric acid stain the skin. This shows that they enter into chemical combination with the organic matter of the skin and is a proof of the limitation of their action. Iodine, the most used of the chemical germicides has a coefficient of 38 without the presence of organic matter, but with only 1% organic matter added the coefficient drops to 7. Alcoholic solutions of iodine do not penetrate the fat of the skin so that the disinfection of the sweat glands is impossible. Stanton claims that iodine delays healing. Picric acid has only a coefficient of 2.5 and is also neutralized by organic matter. Alcohol as a germicide is so weak as to be not worth considering. Antiseptic action is ap-

parently dependent upon different qualities from germicidal action. Inhibition of growth is sometimes produced by substances which have weak germicidal qualities. These may act by preventing the reproduction of the organisms. GEO. A. FLEET

PAEDIATRICS

Reflections on Congenital Syphilis. Findlay, L. *Am. Jour. Dis. of Children*, August, 1924.

This paper is a contribution to the proceedings of the annual meeting of 1924 of the American Paediatric Society.

Dr. Findlay believes that the incidence of congenital syphilis has been grossly exaggerated and that the great importance of the subject lies, not so much in its frequency, but that means for complete eradication of the disease are at our disposal by the treatment during pregnancy of the syphilitic mother. Some years ago it was reported from Glasgow that ten per cent of the infant and child population were affected with congenital syphilis. However, a review of the situation during the last eighteen months shows that less than one per cent is affected, based on the Wassermann reaction.

Regarding the Wassermann test—although it has brought to light no previously unknown manifestations of the disease, Dr. Findlay believes that the most delicate and reliable test of the presence of congenital syphilis is a positive Wassermann reaction, excepting that, in the new-born a positive Wassermann is no proof of syphilis, since antibodies may pass from the placental to the foetal circulation and produce a positive Wassermann reaction without the presence of spirochetes. He has observed several cases, born of syphilitic mothers, in whom the Wassermann was positive during the first month and later became negative, the infant remaining apparently healthy.

In the early days of the Wassermann reaction, in Glasgow many diseases occasionally gave positive reactions and from the published work of that school, Glasgow was considered the most syphilitic city in Britain. However, a more mature consideration of the results has shaken Dr. Findlay's faith in their value. Workers now find the regular presence of a positive Wassermann in frank syphilis, the occasional presence of a positive Wassermann in diseases known sometimes to have a syphilitic basis, and the regular absence of a positive Wassermann in diseases which have not been considered syphilitic in origin. Dr. Findlay does not consider that the evidence so far brought forward, proves the presence of a special strain of spirochete producing a neurotropic toxin causing central nervous system lues, but rather, because of the good general health of these patients, that the nervous system manifestations are due to an attenuated toxin. He believes that the incidence of cerebrospinal syphilis is not so great in the congenital as the acquired form.

The author concludes that the "curative" method of treatment is as dismal a failure as the "prophylactic" method; the treatment of the pregnant mother is a brilliant success. So long as the mother is treated before the eighth month, a full term non-syphilitic child is born. Not only is the offspring not syphilitic, but miscarriages and still-births are avoided, even though the mother's Wassermann is still positive. Subsequent pregnancies also result in healthy children without the mother having further treatment. Occasionally these later children may show faintly positive Wassermann reactions and " must be considered latent syphilitic patients," though they present no clinical symptoms.

The article concludes with a plea for the compulsory notification of all syphilis, or at least the congenital form.

In the discussion of this paper, Dr. Jeans (St. Louis) points out that the incidence of central nervous system involvment may depend on the resistance of the host as well as the virulence of the infective organism. Dr. Veeder (St. Louis) said that in their experience the treatment of congenital lues was unsatisfactory, that the only effective treatment was preventative. R. R. STRUTHERS

Roentgen Ray Studies of the Infant Stomach and Roentgen Ray Studies of Stomach Function—the Peristolic Function. Rogatz, J. F. *Jour. Dis. of Children*, July, 1924.

The early part of the first of these two studies is concerned with a fairly extensive review of the literature on the size, shape, position and emptying time of the infant stomach. The author then reports the results of examination

by fluoroscope and pictures of a number of infants' stomachs after feedings of various kinds. The infants were in all instances held in a vertical position. Examinations were made without the use of contrast mediums (barium and bismuth) as it was not difficult for the practised eye to discern the outline of the partially distended stomach.

The author draws several conclusions; that the filled infant stomach lies in the upper left quadrant of the abdomen close to the diaphragm, and extends in a horizontal plane to, or just beyond, the midline; that all infants swallow air in taking their feedings, and that the amount of swallowed air is less if the feeding be of thick cereal or semi-solid vegetable mush; that thick cereal gruels if made with milk become fluid in the stomach, due to body heat and saliva, whereas vegetable mush retains its semi-solid form. The infant stomach assumes constantly, after a fluid feeding, one of two main forms, pear shaped or ovoid in outline. After thick feedings it assumes an ovoid or circular shape.

The second study deals with the ability of the infant's stomach to contract down around the food that is put into it. After ordinary fluid feedings the stomach is large and ovoid or pear shaped, and the fundus contains a large air bubble. After thick or semi-solid feedings the stomach is much smaller, circular or ovoid in shape and contains little or no air in the fundus. This ability to contract about its contents is known as the "peristolic function." R. R. STRUTHERS

DERMATOLOGY

Pigmentation of the Skin. Warthin, A. S., and Crane, A. W. *Arch. Derm. Syph.*, August, 1924.

This is the report of a case showing extreme pigmentation of the skin, under observation for six years. The pathological study showed primarily, generalized aleukaemic lymphoblastoma. Lymphoid tumours pressed on the suprarenals thus altering the function of the chromaffinic tissue, producing typical Addison's disease. There was marked bluish brown pigmentation, vomiting, diarrhoea, relatively low blood pressure, pain in the abdomen and back, anaemia, disturbance of the nervous system and death.

The pigment in the corium exceeded that in the rete. This usually occurs in Addison's disease. A new finding was that of melanotic pigmentation of that portion of the lymph nodes lying next the skin. The pigment seemed to be elaborated around the capillaries of the papillary layer. It would appear that pigment formation is a function of the corium, with the aid of light or ferments.

That the destruction of the chromaffinic tissue of the suprarenals alters the production of aromatic compounds, and that these circulate in the blood, is given as a hypothesis. The pigment of the rete may be derived directly from the special endothelial cells of the corium; processes extending from these cells into the rete bear out this view. C. R. BOURNE

A Case of Leprosy. Walker, Sir Norman. *The Lancet*, Sept., 1924, p. 542.

The lepra bacillus may be dormant in the body for a long period. Such a case is here reported in a Russian Jewess, where an incubation period of forty years may be presumed. The patient had lived in Scotland during that period and had shown no evidence of the disease. There were characteristic facial nodules of four years' duration.

A vaccine was made by triturating one of the nodules with sand. One. ccm. containing about 200 million bacilli was injected weekly with striking improvement. Chaulmoograte of sodium was abandoned owing to the suffering it produced.

The histology of an early nodule showed granulomatous tissue and bacilli in rod form in "lepra cells" and free in the tissue spaces. In a later nodule the bacillary rods were breaking up into granules and disappearing. Granulation scar tissue was being formed.

Caution is necessary in estimating the value of treatment in a disease where the process may become stationary or ameliorated at certain periods, for a time at least. C. R. BOURNE

ANAESTHESIA AND ANAESTHETICS

Anaesthesia at the Mayo Clinic. Meeker, W. R., M.D. and Hines, Mary, R.N. *Brit. Jour. of Anaesthesia*, July, 1924.

The anaesthetist is now accorded the rank of specialist in the operating team. The understanding between him, the surgeon and the

other members has reduced the mortality in such conditions as exophthalmic goitre, obstructive jaundice, diabetes, etc.

None of the present methods of anaesthesia is absolutely safe and not one anaesthetic is indicated in all cases. The claims at first made for improved ethers have not been justified. The contention that chemically pure ether has no anaesthetic action was disproved by Stehle and Bourne. The semi-open method of administering ether is used at the Mayo Clinic. The writers are not convinced of the value of rectal or intravenous ether. Against intratracheal insufflation the writers adduce the special knowledge of technique necessary for the introduction of the catheter, the harm to the laryngeal structures, the interference with the circulation in the lungs, the increased intrapulmonary pressure, the fact that emphysema of the lungs has been caused. Warmed ether vapour has not been found less irritating to the mucous membrane than unheated vapour, and is probably of no value in conserving the energy of the patient by lessening the elimination of heat by the lungs.

For the successful employment of gas and oxygen the personal equation of both surgeon and anaesthetist is most important. In prolonged anaesthesia, i.e., more than half an hour, nitrous oxide with oxygen is more dangerous than ether. The difficulty is to maintain anaesthesia and at the same time give enough oxygen. It is by far the most difficult anaesthetic to administer. Ethylene and oxygen influence the pulse and blood pressure less than any other anaesthetic. Nausea and vomiting are very rarely troublesome or prolonged. The degree of muscular relaxation is intermediate between nitrous oxide and ether.

Local anaesthesia is much used at the Mayo Clinic in operations about the nose, throat and face, and operations on the cranium are done by this method. A few whiffs of ether may be necessary when the skull is being trephined. Tumours of the hypophysis have been entirely removed under local anaesthesia. In operations on the neck, blocking of the cervical plexus is sometimes necessary to get a deeper anaesthesia than that obtained by ordinary infiltration. Many cases of thyroidectomy are done partially or entirely under local anaesthesia. Regional or local anaesthesia is used in many cases of hernia, in superficial operations on the pelvic floor and viscera, in some cases of anal fistula and in haemorrhoidectomy. Thoracic and lumbar paravertebral nerve block have been found to have a very limited sphere of usefulness. Spinal anaesthesia is not much used except in amputations and extensive opertions on the legs when a general anaesthetic is contraindicated. W. B. HOWELL

Clinical Experiences with Ethylene Anaesthesia. Davis, S. G. *Am. Jour. of Surgery*, July, 1924.

Ethylene was used in a series of one hundred cases. Of these eighty-two had ethylene and oxygen alone. In the remaining eighteen cases some ether was added. The duration of the operations was from fifteen minutes to two hours. The youngest patient was five years old and the oldest eighty-three. Satisfactory anaesthesia without any harmful after effects was obtained in one case of amputation of the leg for diabetic gangrene, and another of delivery in eclampsia.

An indefinite mixture of ethylene and oxygen was used. Some patients complained of the disagreeable smell and an unpleasant taste afterwards. These disadvantages can be avoided by passing the gas through water or gauze impregnated with some essential oil. Ethylene can be administered with any gas machine. The cost per hour comes to about half the price of nitrous oxide. It is easier to obtain relaxation with it than with nitrous oxide and oxygen. W. B. HOWELL

Medical Societies

The Meeting of the INTERNATIONAL UNION AGAINST TUBERCULOSIS at *Lausanne, Switzerland, 1924*

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Lausanne is an ideal place for a large conference. Its geographical position, its beautiful situation and surroundings, its substantial architecture in a setting of trees and shrubs, and its facilities for the accommodation of guests, all combine to justify its choice for that purpose. The formal opening of the conference took place in the forenoon of August 5th, the President of the Swiss Confederation, M. Chuard, in the chair. After his address of welcome, speeches were made by Dr. Dewez, President of the International Union; Dr. Morin, Chairman of the Conference; Prof. Leon Bernard, Secretary-General of the International Union, and by Professor Arthus, Dean of the Faculty of Medicine of Lausanne.

The scientific work began with a paper by Professor Calmette, Sub-Director of the Pasteur Institute, Paris. The subject was, "Do There Exist in Nature or Can There be Artificially Produced, Saprophytic Varieties of Koch's Bacillus, which possess the Property of Becoming Virulent Tubercle Bacilli?" After enumerating the large number of paratubercle bacilli which have been described, he stated that it was natural to inquire if these microbes are not the result of the transformation of the tubercle bacillus under the influence of environment. On the other hand it might be supposed that the tubercle bacillus represents the progressive adaption of a single acid-fast saprophyte to a parasitic life. These hypotheses have been long discussed without reaching definite conclusions, though the questions were important.

1.—The paratubercle bacilli show certain morphological and cultural differences from the true tubercle bacilli, and on inoculation or ingestion in warm blooded animals form pseudotubercles which rapidly disappear. They are not agglutinated, or very feebly, by serum from a tuberculous animal, but they can be used as antigens for detecting tuberculosis in the complement fixation test of Bordet and Gengou. In culture media they produce substances like tuberculin but are practically non-toxic for the tuberculous animal.

2.—A number of workers have reported that they had obtained positive results in transforming paratubercle germs into true tubercle bacilli. These results were criticized unfavourably and the negative results of other workers were cited. His own experiments with Moeller's timothy grass bacillus over a large number of experiments showed no increase in virulence. The conclusion was, "that we have no evidence up to the present which would lead us to believe that paratubercle bacilli can become tuberculogenous by culture *in vivo*, or by passage through warm blooded animals."

3.—Attempts to produce a paratubercle germ from virulent tubercle bacilli have been unsuccessful. Even when cultivated over a period of thirteen years and after 230 successive cultures on potato saturated with 5% glycerinated ox bile, tubercle bacilli remained acid-fast, but had become incapable of causing tubercles. This avirulent form, however, produced a tuberculin quite as active as that from normal tubercle bacilli, and produces antibodies just like true tubercle bacillus, hence it must be a true Koch's bacillus physiologically modified.

4.—Attempts to protect animals against tuberculosis by vaccination with paratubercle bacilli have been quite unsuccessful.

In view of these facts it must be concluded that tubercle bacilli, bovine, human, and avian, form a group of definitely specific organisms. Consequently there is no reason for considering paratubercle bacilli, not definitely pathogenic, as offering any danger to man or to animals susceptible to tuberculosis.

A paper was read by Professor H. Forssner of Stockholm on "The Relationship between Pregnancy and Tuberculosis." Starting with a review of the past opinions on the subject, he showed that it has been generally believed that pregnancy has a harmful influence on the course of tuberculosis. As to the degree of this harmful influence there was much disagreement, and consequently much variation in treatment. Some writers, particularly the French, were conservative, others went to the extreme of terminating the pregnancy in every case, and even of doing radical operations. It is now necessary to consider the real extent of the knowledge which we possess. Three questions come up for consideration, the first being the most important.

1.—"Does pregnancy as a rule have a harmful influence on pulmonary tuberculosis, and in what cases?" In spite of the prevailing opinion that it has such an effect, this question has not been settled. Statistics given up to the present time are not reliable, and opinions the result of observing certain given cases are not of great value. With regard to a particular case even most carefully observed, we cannot determine whether the aggravation during or after pregnancy is *post or propter*.

After examination of all women confined in the two maternity hospitals of Stockholm over a period of six years, tables were constructed showing results over a period of two years in a series of tuberculous women who became pregnant, as compared with a series of tuberculous non-pregnant women. Both series were arranged according to Dr. Turban's classification as regards the stage of the disease. The results showed no difference in the case of women in the first stage of tuberculosis, and a slight difference in favour of the non-pregnant women in the more advanced stages. It is held that these statistics show the error of the old theory of the ill effects of pregnancy on tuberculosis, but it is admitted that a complete answer to the question is not at present available.

2.—The second question is:—"Are the children of tuberculous subjects of negligible value, or have they some importance in the population?" We know that children born of tuberculous mothers, no matter in what stage of the disease, are not born tuberculous. Statistics show that if such children are taken away from the harmful influence of familial tuberculosis, they can be brought up as easily as other children. If, however, they remain in a tuberculous environment they very often contract the disease.

3.—The third question:—"Does abortion increase the chances of resistance to the tuberculous process in the mother?" has really been answered by the reply to the first question. All writers are agreed that to interrupt pregnancy in the second and third stages of Turban's classification, is to invite disaster. In the first stage, the only one in which there has been disagreement, there is no proof that abortion has been of value in preventing development in a case of tuberculosis. "We know what we are sacrificing,—a child—but we do not know what we shall gain." Apparently it is no more dangerous for the tuberculous woman in the first stage

to go through pregnancy. By allowing the pregnancy to continue, we obtain for the race, healthy children just as viable as other children.

During the discussion which followed this paper, some speakers supported the views expressed therein, others considered that pregnancy did have an ill-effect on the mother. There was general agreement that production of abortion was entirely unjustifiable, that no tuberculous woman should suckle her child, and that the child should be removed from danger of infection.

A paper entitled:—"The Effects of the Anti-tuberculosis Campaign on the Diminution of Mortality from Tuberculosis," was read by Sir Robert Philip, of Edinburgh, Scotland. It aroused a great deal of interest and discussion. The importance of the question and the necessity for correct data were emphasized. Attention must be centred especially on results observable in countries where sound and satisfactory measures have been in operation for a sufficiently long period. The facts relating to Great Britain and to the Registration Areas of the United States were of value because the statistics covered a period of over twenty-five years.

A properly organized campaign against tuberculosis has two main objects:—One, the limitation of passage of infection from one individual to another, the other, the raising of resistance to the disease, both in the individual, and in the population as a whole. The first is attained by the usual methods of prophylaxis, taking especial care of the child. The second depends on general prosperity, good housing, education regarding the disease, maternity and child welfare, medical education and research.

A specialized organization against tuberculosis should attend to all the details of searching for and dealing with cases of tuberculous infection. This necessity led the writer, Sir Robert Philip, to institute the tuberculosis dispensary in 1887. This has become the first and most important unit in the tuberculosis scheme, the second unit comprising the various forms of residential institutions. Definite anti-tuberculosis work began in Great Britain about 1870, and increased in scope till now notification of the disease is compulsory, and its systematic handling is within the scope of the National Insurance Act. Only after years can results in combating such a disease be expected, but the time has already come when effects can be shown.

By means of charts based chiefly on Scottish statistics, it was shown that in the fifty years 1871—1921 there has been a remarkable diminution in mortality from "all tuberculosis" and from "pulmonary phthisis." The percentage drop has actually increased. and recently has accelerated in a surprising degree. This accelerated drop has occurred also in the mortality rates of England and the United States. It is not due to the fall in death rate from "all diseases" since it is much greater than that drop. The reduction as shown in age group tables is greater in the younger age groups, from 1 - 10 and from 10 - 45 than in the older age groups.

The general saving of life effected by the reduction of the tuberculosis death rate has been stupendous. This is shown by a table noting the number of deaths which would have occurred in 1921 if the death rate had been the same as in 1871, and comparing this with the actual number of deaths. In Scotland there was a saving of 9,244 lives. It must be remembered that this fall has occurred in spite of better diagnosis of the disease in recent years. In places where this marked drop in tuberculosis mortality has occurred, there has also been a systematic attempt to combat the disease. Where the mortality rates remain high it is safe to predicate a lack of such effort. The great fall in mortality has been recognized by business men and insurance companies, who are now taking part in the campaign on account of its benefit to the individual and to the community.

The discussion following the paper was very full, speakers from many countries took part and the general opinion was strongly corroborative of the conclusions reached by the speaker.

Lectures were delivered by Professor Sahli, of Berne, on "The Defence of the Organism against the Tubercle Bacillus," and by Professor Leon Bernard, of Paris, on "Prophylaxis in Childhood against Tuberculosis." These masters gave a thorough review of their respective subjects.

Following the conference there was an eight-day trip to the best known centres in Switzerland for the treatment of tuberculosis. A large number of members availed themselves of a most instructive and delightful tour. Leysin, where Dr. Rollier has developed heliotherapy; Montana, Heiligenschwendi, Berne, Zurich, Davos, and Arosa were visited. The wonderful organization, the unwearying kindness and attention of our Swiss hosts evoked our highest admiration and gratitude.

The next Conference will take place in America two years hence in either Washington or Philadelphia.

THE AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY

The twenty-ninth annual meeting of the American Academy of Ophthalmology and Oto-Laryngology was held in Montreal on September 16th, 17th and 18th with headquarters at the Mount Royal Hotel. There were registered about 400 specialists from various parts of the United States and Canada. The whole of the ninth floor of the hotel was occupied by the Academy. The large ball room was used for registration and commercial exhibit purposes, the dining hall as a general meeting room and a very elaborate pathological exhibit was placed in the small committee room at the hall end.

The meeting was held under the presidency of Dr. Walter B. Lancaster of Boston. On Tuesday morning at the first session the Academy was welcomed to Montreal by Sir Arthur Currie, Principal of McGill University. This was followed by Dr. Lancaster's presidential address after which the papers of the programme were proceeded with. The council inaugurated a change in the routine of the meetings this year by having one joint session instead of one in ophthalmology and one in oto-laryngology, consequently the programme was so arranged that at each meeting there would be something of interest to all of the specialists.

At the session on Wednesday morning the meeting was addressed by Col. Henry Kirkpatrick of London on "Some Aspects of Primary Cataract." Col Kirkpatrick, who

came to Montreal as the official guest of the society, was in charge of the Ophthalmic Hospital in Madras for some time and succeeded Col Elliot there. Among the contributing causes to cataract mentioned by Kirkpatrick was low grade infections due to auto-intoxication; diabetes was also noted, also the possible influence of the endocrine glands as a cause of the disturbed para-thyroid gland, a condition often seen in these cases. The effect of strong light was also noted. Col. Kirkpatrick's address was greatly enjoyed by the members. The rest of the morning session was taken up with a symposium on papilloedema. "The Mechanism of Papilloedema" was the title of the paper by Walter R. Parker of Detroit, who referred to the three principal theories, the inflammatory, the toxic or chemical, and the mechanical, with some experimental report showing confirmation of the mechanical theory.

Dr. James Pordley of Baltimore, was the next speaker on "The Significance of Papilloedema to the Ophthalmologist." He discussed the importance of early diagnosis; whether choked disc is always dependent upon an increase in intra-cranial pressure, or may be a symptom of various disorders and should be so treated. A study of the fields of vision offers only minor advantages but loss of central vision is a danger sign and should be carefully studied. The next speaker was Dr. Leon E. White of Boston, on "The Significance of Papilloedema to the Oto-Laryngologist." Papilloedema when present in meningitis, brain abscess, and lateral sinus infection is a valuable diagnostic aid but its absence does not exclude intracranial involvement. Dr. White classified nerve head changes under three headings:—(1) Marked papilloedema; (2) Slight or early papilloedema;; (3) Blurry disc margins. Optic nerve changes were found in 58% of the cerebellar abscess cases, and in 60% of the tempero-sphenoidal cases. The fundi were normal both in the frontal abscess; and meningitis cases arising from nasal infections. Forty-three per cent of the meningitis cases from middle ear cases showed optic nerve changes. Normal fundi were found in 50% of the meningitis cases with increased spinal fluid pressure. Streptococci were the only bacteria found in cases showing optic nerve changes. Forty per cent of the infected lateral sinus cases had optic nerve changes. The fundi were normal in 45% of the lateral sinus cases with spinal fluid under increased pressure. Oedema of the disc was found in but 4% of the optic nerve disturbances arising from infections in teeth, tonsils, or accessory sinuses. The so-called papilloedema from infections in the accessory sinuses teeth or tonsils is not identical with that associated with brain abscess, meningitis, and lateral sinus infections. It would seem advisable to designate the oedemas associated with sinus infections as "optic neuritis with oedema," and restrict the word papilloedema to the oedemas of the disc caused by intracranial pressure.

Dr. Horrax of Boston, then continued the discussion on "The Significance of Papilloedema to the Neurological Surgeon," and took up the study of a series of patients presenting papilloedema with reference to:—(1) Previous suppositions as to the causation of the choked discs in these cases and the therapy employed; (2) Subsequent verified diagnosis and treatment; (3) Conclusions. Following these papers a general discussion took place, participated in by a large number of speakers.

On Wednesday afternoon there was held a symposium on cataract. Among some of the other papers given were "The Value of the Fusion Faculty and Methods for its Development," by D. W. Wells of Boston, "Congenital One-sided Paresis of the Abducens Muscle," by Harrold Gifford of Omaha, "The Etiology of Phlyctenular Kerato-Conjunctivitis," by W. W. Blair of Pittsburgh, who presented a study of the general conditions, the home surroundings, family history, and economic status in connection with 1,086 cases seen in the eye clinic of the University of Pittsburgh. "The Etiology and Treatment of Scleritis," by Dr. W. L. Benedict of Rochester. "Sensitive Test Charts for Refraction," by Jonas S. Friedenwald of Baltimore.

On Thursday papers were presented; the following: "A Further Study of the Toxic Effects of Local Anaesthesia," by Dr. Emil Mayer of New York; "Pulmonary complications with Death Following Tonsillectomy," by Dr. Judson Daland, Philadelphia; "The Bronchoscopic Treatment of Tracheo-Bronchial Asthma," by Dr. W. M. F. Moore, Philadelphia; "Observations on Fifty Cases of Foreign Body in the

Air and Food Passages," by Gabriel Tucker of Philadelphia; "The Present Status of Electro-Therapeutic Measures used in the Practice of Oto-Laryngology," by Joseph C. Beck of Chicago.

On Monday preceding the opening of the Academy about forty members engaged in a golf tournament at the Dixie Club, and stayed there for dinner, when the prizes were presented. Ample opportunity to play golf was provided during the meeting by the Dixie and other Clubs. The annual banquet was held in the Mount Royal on Wednesday evening, and took the form of a dinner dance. There were over three hundred present.

The regular session of the Academy was followed by the Instructional Course in the Biological Building of McGill, and consisted of a two-days' intensive course of lectures. On Thursday evening the subject taken up was Diabetes. "The Rôle of Diabetes in Ophthalmology," by Dr. W. R. Parker of Detroit; "The Rôle of Diabetes in Oto-Laryngology," by Drs. Hempstead and S. F. Adams, of the Mayo Clinic; "Fundamentals and the Modern Therapy of Diabetes Mellitus," by Dr. I. M. Rabinowitch of Montreal. On Friday and Saturday the members listened to a series of lectures on a wide range of subjects.

S. H. McK.

Preventive Medicine and the Future of Medical Practice.—Henry F. Hemholz, Rochester, Minn., is of the opinion that the medical education of pediatricians in many schools has been, in a measure, incomplete, because of insufficient work in preventive pediatrics. A pediatrician without the preventive point of view is no pediatrician. The practice of pediatrics will become more and more a practice of preventive medicine. The physician's work with the sick, by his own effort, is being taken away from him. He aims to prevent disease which formerly he was called on to treat; thus his work has changed, but not disappeared. In the measure in which he interests himself in this campaign of prevention will the public appreciate and demand his services in prevention of disease, as it has formerly done in its cure. Pediatrics is the only branch of medicine in which the physician takes special training to do general practice in an age period. The pediatrician should be a physician of broad medical training, who is also able to supervise the growth and development of the child and observe its reaction to environment. The distinguishing feature of a pediatrician, then, is his knowledge of preventive medicine. Preventive measures will grow to play an increasing part in the work of the general practitioner, and if the appreciation by the public of the service rendered by the pediatrician is any criterion, the general practice of medicine should undergo a similar development, provided the general practitioner will meet the demand of the public.—*Jour. Am. Med. Ass.*, Aug. 16, 1924.

The Results of Tryparsamide Therapy in Syphilis.—Joseph Earle Moore, Harry M. Robinson and Richard S. Lyman, Baltimore assert that in primary and secondary syphilis, or in tertiary syphilis without nervous system involvement, the therapeutic effect of tryparsamide is so slight as to preclude its further general use in these types of infection. In neurosyphilis, on the contrary, tryparsamide therapy produces favourable clinical and serologic results, which we believe cannot be equalled by other forms of treatment. Tryparsamide is of particular value in early general paralysis, in meningovascular neurosyphilis, and in the majority of cases of tabes. Advanced general paralysis is benefited little, if at all. In early neurosyphilis, the comparatively feeble spirocheticidal value of tryparsamide precludes its use unless in combination with an arsphenamin. The best method of use of tryparsamide has not yet been developed. Visual disturbances following tryparsamide have occurred in 17.8 per cent of a series of 241 cases; but in only 2.8 per cent has noteworthy permanent visual injury resulted. This untoward effect may largely be obviated by appropriate ophthalmologic control of treatment.—*Jour. Am. Med. Ass.*, Sept. 20, 1924.

Obituary

DR. W. H. B. AIKINS

Dr. W. H. B. Aikins died on Thursday, October 2nd. By his death Toronto loses a practitioner who has always been prominent in the medical activities of the city, and one whose interest and assistance in medical and journalistic matters will be greatly missed. Born in Peel County in 1859, Dr. Aikins was one of a family that has given much to the service of Canada; many of them have stood high in the ranks of our profession. His father, the Honorable J. C. Aikins, was Secretary of State in the Government of Sir John A. MacDonald, and Sir James Aikins, his brother, is well-known as the Lieutenant Governor of Manitoba. The late Moses Henry Aikins, an uncle of the late doctor was a practitioner of exceptional experience and knowledge, and there are many to-day who remember well the surgical teachings of William Thomas Aikins, another uncle, who ably filled, for many years, the chair of surgery in the Toronto School of Medicine.

DR. W. H. B. AIKINS

Dr. W. H. B. Aikins was educated at Upper Canada College, and at the University of Toronto, and later studied in New York, London, Edinburgh, Paris and Vienna; he began to practise in Toronto in 1884, and was at various times consulting physician to the Toronto General Hospital, to the Toronto Hospital for Incurables and to the King Edward Sanitarium. In latter years his interest in radium cultivated by investigation abroad led him to the establishment of the Radium Institute, and he was the first in Ontario to speak authoritatively on the treatment of disease by radium; many papers contributed by him to the Radiological Association show the extent and thoroughness of his work.

Dr. Aikins was a member of both the Canadian and Ontario Medical Associations, a past president of the American Radium Society; for many years he had acted as secretary for Canada of the International Medical Congresses which met in Lisbon, Budapest and London.

As senator of Toronto University representing the graduates in medicine, Dr. Aikins has always enjoyed the confidence of those whom he represented. He was keenly interested in all that had to do with the progress of his many associations, was an active and loved practitioner, and possessed those social qualities which endeared him to a large circle of his co-workers.

Dr. John Murphy, of St. John's, Newfoundland, died on September 18th, at the early age of thirty-two years.

Dr. Murphy was a graduate of London, England, and had only been in practice at St. John's for five years, specializing in gynaecology, in which he was eminently successful. His pleasing gentle manner ingratiated him with all whom he came in contact, and it was a great tribute to the unity of the profession in St. John's how they rallied around his bedside in his last illness. Stricken suddenly with an ascending paralysis, the muscles of respiration became paralyzed, and for seven days his medical brethren continued artificial respiration, one relieving another night and day until the end came. He remained conscious all through his illness, and it was deeply touching, the gratitude he tried to express to those who were working so hard to prolong his life.

Never before has St. John's been so stirred by a death in the medical profession. Cut down in early manhood, leaving a wife and three small children, the circumstances surrounding the illness appealed to all, and found expression in the largest funeral procession ever known in St. John's.

Dr. F. W. E. Wilson died at Niagara Falls on September the 23rd. Dr. Wilson was born at Mitchell, Ontario, fifty years ago, and had practised in the Niagara peninsula for many years. He was keenly interested in all local affairs, had been president of the County Conservative Association, and of the Rotary and Canadian Clubs in that district. An earnest student of medicine, he had studied in many countries since his graduation . At the outbreak of the war Dr. Wilson left his practice for military service overseas, and on arrival in England was appointed D.A.D.M.S., later he became A.D.M.S. of the Canadian training services with the rank of Lieutenant Colonel. He served in the field as medical officer of the 50th Battalion, and subsequently was posted to the command of the medical services of the Canadian Forestry Corps In recognition of his war services he was decorated as a C.B.E. and was twice mentioned in the despatches. Dr. Wilson is survived by his wife, a daughter of the late Right Honorable John Ferguson, and by two children.

Dr. Charles Woollard died in Vancouver on September 22nd from blood poisoning aggravated by war injuries. He was born in England, and came to Canada when a young man of nineteen, and after working for a time on a farm decided to go in for medicine and entered Manitoba Medical College in 1897. In 1900, when the South African War broke out, he volunteered and

went overseas with the Canadian Artillery. He was wounded in the arm and returning to Winnipeg, finished his medical course, and became an interne in the Winnipeg General Hospital. He started practice in Winnipeg but owing to ill health took a position as ship's surgeon on the boats sailing between Vancouver and Australia. After two years of life at sea, he went home to England, and in nine months was able to take the London qualifications of M.R.C.S., and L.R.C.P. He returned to Canada and started to practice in Vancouver. On the outbreak of the war he joined the C.A.M.C., and on arrival in London was selected for the headquarters military medical staff in London where he was highly thought of as a dependable officer. He held the rank of lieutenant-colonel. When the Vancouver Military Hospital was organized he became its first commanding officer, being asked to return from the scene of conflict to take up this important post, which he only relinquished when it came under the direction of the S.C.R. He subsequently was appointed one of the local medical officers of the Board of Pension Commissioners. Of a retiring nature, he was highly respected by his confrères, and also by the numbers of ex-soldiers with whom he came into contact. In spite of the many rebuffs due to ill-health he was always cheerful, and absolutely honourable. Dr. Woollard leaves a wife and two little girls, besides a large circle of close friends.

Dr. A. McLaren died in London, Ontario on September the 22nd. Dr. McLaren was well known in London and had been a coroner in that city for many years.

Dr. Orville Winthrop McMichael, a graduate of the University of Toronto, died in Chicago on October the 2nd. Dr. McMichael was born in Toronto, and graduated with a B.A. degree in 1891, and from the Niagara University Medical College and Hahneman Medical College in 1895. Dr. McMichael had worked entirely on the treatment of tuberculosis, and was one of the first to make use of the operation of induced pneumothorax.

A Simple Remedy for Senile Pruritus.—Dr. Francis Veress, lecturer on dermatology at the University of Cluj, writes that the troublesome itching to which many persons advanced in years are subject is a condition which so far has proved refractory to every kind of treatment, both external and internal. This failure to relieve has been explained on the assumption that the symptom is due to senile changes in the deeper layers of the skin or in the sensory nervous apparatus. Dr. Veress states, however, that the itching is almost invariably relieved by rubbing the skin over the pruriginous area with a soft brush for from twenty to twenty-five minutes two or three times daily. After a few days, a single application of the brush before going to bed suffices to avert its recurrence. The brushing removes much epithelial débris, the presence of which is the cause of itching; but it is important to avoid the use of a hard brush, which is apt to intensify the cutaneous irritation. It is well to swab the surface, after brushing, with pure spirit or cologne water, allowing to dry by evaporation, and when this application is not well borne, to use hydrous wool fat or petrolatum. The treatment, of course, is not as radical as the application of roentgen rays, but it appears to provide the means for mitigating and controlling an otherwise intractable condition.

Diet and Growth.—G. Mouriquand, P. Michel, and L. Barre (*Journ. Méd. de Lyon*, February 20th, 1924, p. 95) review the present state of knowledge of the nutritional factors of growth as follows: An adequate diet for a growing child must provide (*a*) a sufficient number of calories; (*b*) the three categories of foodstuffs —protein, fat, and carbohydrate; (*c*) certain amino-acids which are indispensable for the formation of new tissues ("aliments plastiques"); (*d*) accessory food factors— that is, vitamins and mineral salts. The number of calories required per kilo of body weight is highest in infancy and gradually decreases with age. For a breast-fed child the number is put at 90, for one artificially fed at 100. When the age of two years is reached the number of calories required for health has gone down to 67 per kilo body weight; by the age of five it is reduced to 62; at ten it is 54; at fourteen, 48; and in the adult it is about 37. A certain balance must be maintained between the quantities of protein, fat, and carbohydrate, each element being necessary to the most advantageous employment of the other two by the body. The proteins furnish material for the formation of new tissue, but are not all of equal value. The amino-acid groups, lysin, tryptophane, cystine, arginine, histidine, are all necessary for sustenance and growth, and a protein like gelatin, which does not contain these groups in its molecule, cannot further growth, and can only be utilized by the body when these groups are provided by other proteins. The proteins of milk contain all the necessary amino-acid groups.—*Brit. Med. Jour.*, July 19, 1924.

Medical News from the British Empire

GREAT BRITAIN

The after-history of tuberculosis sanatorium patients has been the subject of a great deal of investigation by the Medical Research Council. Their latest inquiries* have been made with regard to the patients of Brompton Hospital Sanatorium at Frimley during the period 1905—1914. The usual difficulties of tracing patients after their discharge were increased by the widespread shifting of the population in the after-war years. Nearly 1,400 of the 3,400 patients followed up, had been lost sight of, but by persistent efforts the authorities eventually succeeded in tracing over 1,000 of these. Recourse was had to advertising in the press, personal canvassing and a study of the returns of the Registrar-General. So that only about 10% of the number of patients on record were actually lost sight of.

For the purpose of this investigation the condition of the patients on admission to the sanatorium was classified into three groups: No. I, incipient; No. II, moderately advanced; No. III, far advanced. The results of treatment on discharge were classified as arrested, much improved, improved, stationary, or worse, and the first point determined in the inquiry was the mortality of patients according to the condition on admission in comparson with the standard death rates for the population. This comparison showed that where one death was to be expected in accordance with the standard table there were four in Group I, sixteen in Group II, and over 40 in Group III.

As regards the mortality according to the condition on discharge, patients discharged in the class "arrested" showed a lower mortality than those in the other categories; the large majority of those discharged "worse" died soon after discharge, about one-half of the deaths occurring in the first year. Of Group I (incipient) exactly 75% were discharged arrested and only about 2% were "worse"; while in Group IV only 4% were discharged "arrested" and 30% were "worse," showing what a small number of this group may be expected to be benefitted.

*Medical Research Council Special Report No. 85.

The absence or presence of bacteria in the sputum proved to bear a very definite relationship to the mortality. Those with negative sputum on discharge, even if they had originally shown the bacteria, had a much more favourable mortality than those whose sputum proved positive on discharge. This report also supports with statistics the experience of clinicians that the earlier the stage at which the disease comes under sanatorium treatment the greater is the chance of survival. It is shown that in the early cases of Group 1, 79.3% of the male patients, and 89.7% of the female survived five years, and after ten years the survivors were 65.2% and 85.2% respectively. In the far advanced cases the results were not satisfactory. Of those discharged "worse" 93% were dead by the year 1918, and of these 58% occurred in the first year after leaving the sanatorium. The moderately advanced cases 56.8% of the males and 67.4% of the females lived five years more, and 38.2% were alive at the end of ten years.

Sir William Hamer's report on the Health of London shows an increased mortality in tuberculosis for the three years preceding 1923, but in that year there was a decrease greater than any year since 1910, excluding abnormal figures of the war period. A fall may also be expected for the following years as the percentage of early cases dealt with in 1918 was much greater than in 1914, and the principle of giving ex-service men the benefit of the doubt has also helped.

As regards their after-histories the ex-service cases have a great advantage over the civilian as they are not limited as to duration of institutional treatment and have a well-endowed scheme of after-care. The results are strikingly shown by the figures of the survivors of the "moderately advanced" cases. In 1923 the ex-service cases of this type alive were 51% of a large number followed up, whilst of civilian males only 24% and of civilian females only 28% were alive.

AUSTRALASIA

The subject of national health insurance has been before the Australian public for some years, and the latest development has been the appointment of a Royal Commission to examine into the question, and advise the Federal Government as to whether or not there is need for legislation in this connection, and make suggestions as to the best form of insurance. The Commission is making exhaustive inquiries into the matter, but there seems still something to be done towards working out a scheme which will both meet the circumstances of the profession and be of most advantage to the public. No little difficulty is experienced apparently, in getting replies to the questionnaires sent to the general body of practitioners; many seem to think that the English plan of insurance will be adopted, and of this there is much criticism.

The Federal Government, however, has pledged itself to the introduction of some form of national health insurance containing "compulsory machinery." The Commission has not yet formulated a policy to present to the government, but it is urged by leading medical men that the profession should not wait for such a policy, but should themselves work out some plan to put before the legislature. Medical men are being reminded of how their English confréres were not prepared for the legislation enacted in 1913 regarding national health insurance; but no such excuse should be made in the present case.

There seems to be a widespread feeling that there is no necessity for introducing any of the existing plans of national health insurance. It is pointed out for example, that the provisions of such insurance are not actually designed to reduce the amount of infective disease; and as to there being many in the country who get no medical benefits at all (a point urged by the Royal Commission) it is stated that this can only be because of geographical difficulties, or of improvidence on the part of the people. The hospitals, friendly societies, and other institutions provide amply for medical attendance in varying degrees. The pro-

fession hesitates also in entertaining the proposal to shift contract practice from its present position with the friendly societies, to a position fathered by the government. The former is admittedly not the ideal arrangement, as there is often a lack of the best possible means of diagnosis and treatment; but the latter is not welcomed as the most desirable alternative.

However, the question is going to be vigorously dealt with and the profession cannot evade it. What is needed is a plan which will provide for the maximum value of medical service, and the most important aspect of any such plan should be that dealing with the prevention of disease. Universal support would be given to any well-devised scheme which would embody this aim.

An appeal is being made to the Australian public for funds on behalf of cancer research. The movement was initiated by the Senate of the University of Sydney in November, 1923, the suggestion being made that a cancer research institute be founded which should attack the problem from different points of view but with complete coordination of all investigations. This would be in accordance with the most approved methods.

The first step being taken now is with regard to publicity and education propaganda, and the establishment of special cancer departments at various hospitals; a special library is to be founded and a cancer bureau formed. The medical journals and newspapers are to be used to inform the public as to the importance of such research, and to make them appreciate the difficulties surrounding the work. Above all it is required to dwell on the fact that what is being aimed at is the etiology of cancer.

A. E. McD.

News Items

GENERAL

WARREN TRIENNIAL PRIZE

The Warren Triennial Prize of the Massachusetts General Hospital, founded by the late Dr. J. Mason Warren, in memory of his father, provides that the accumulated interest of the endowment fund shall be awarded every three years to the best dissertation considered worthy of a premium, on some subject in physiology, surgery, or pathological anatomy; the arbitrators being the General Executive Committee of the Massachusetts General Hospital. Theses submitted for competition for the year 1925 shall be on some special subject in physiology, surgery, or pathology. The amount of the prize for the year 1925 will be $500. In case no dissertation is considered sufficiently meritorious, no award will be made. Dissertations will be received until April 15, 1925. A high value will be placed on original work. For further information application should be made to: Frederic A. Washburn, M.D., Director.

NOVA SCOTIA

The Provincial Department of the Public Health and the Nova Scotia Division of the Canadian Red Cross Society are co-operating in arrangements for health exhibits at the various county exhibitions. Health talks, lantern illustrations and distribution of literature are features of the programme. Tuberculosis clinics are being held at some points to synchronize with exhibition dates.

The Nova Scotia profession is interested in a series of district meetings which have been arranged at Annapolis Royal, Halifax, New Glasgow and Sydney for the latter part of October . These meetings are to be held under the auspices of the Canadian Medical Association, in accordance with its policy to assist in providing opportunities for physicians to hear modern medical problems discussed by eminent practitioners without going far afield. Doctors A. T. Bazin, of Montreal, and Dr. Young, of Toronto, have been chosen to deal with clinical problems, while Dr. Routley, the General Secretary of the Association, will take up matters which more particularly concern the relation of the Association and the practitioner to the public.

At a recent meeting of the Social Service Council of Nova Scotia, a committee was appointed to arrange a conference between the Committee on Mental Hygiene of the Medical Society of Nova Scotia and the various other organizations interested in public welfare, with the object of devising means to demonstrate the necessity for governmental action in respect of the several problems associated with mental degeneracy. Dr. Smith L. Walker, Associate Secretary of the Medical Society, is acting as liaison officer and is endeavouring to collect material data for the consideration and guidance of the proposed conference.

Classes in the medical school of Dalhousie University were resumed on the tenth of September. Registration is considerably in excess of last year. The graduating class numbers forty-eight, and the clinical facilities are considerably taxed to provide for that number. Other classes are being regulated as to size, so that future graduating classes will not exceed thirty. By this arrangement ample opportunity for clinical study is assured. All the laboratories are capable of dealing with much larger classes, and are well equipped and staffed, but the importance of the clinical teaching is fully recognized and special emphasis is being given to it. With the opening of the University Health Centre, about the middle of October, the students will have the advantage of much more instruction than has previously been possible in outpatient clinics, and also in a number of public health clinics. It is intended to use the health centre as a medium for demonstrating the influence of social conditions upon the incidence and clinical course of illnesses.

The Halifax Visiting Dispensary, an institution which has for many years rendered a splendid service to the necessitous sick of Halifax and Dartmouth, will enter upon a new phase of its existence with the opening of the Dalhousie Health Centre. The building on Brunswick Street, which was erected by the dispensary for its own special purposes but which was at

all times freely available to other health and social agencies, will be vacated and the dispensary activities will be transferred to quarters provided in the Health Centre building. The Dispensary will continue to provide a visiting medical service and to furnish medicines, etc., to poor people, but the out-patient clinics which it now conducts will be taken over by the university. Medicines, dressings and appliances required in the new out-patient clinics will be supplied by the dispensary, which will in no way lose its identity but will really be able to extend its usefulness by co-operation with the university.

The Halifax Branch of the Medical Society of Nova Scotia is to open the 1924-25 session by a dinner meeting, to be held at the Ashburn Golf and Country Club on the evening of October 15th, at which Dr. E. V. Hogan will deliver his presidential address. Several clinical meetings will be held at different hospitals during the session. Two evenings will be devoted to the consideration of haemorrhage in its various aspects, and two other evenings to everyday obstetrical problems. Dr. Morse, Dean of the Medical Faculty of the Western China Union University, who is now enjoying a holiday at his old home in Nova Scotia, will address one meeting on medical and surgical conditions in western China. The programme for the winter promises to be exceptionally interesting, and a very successful session is anticipated.

The organization of the medical profession of Nova Scotia into branches of the provincial medical society has been completed by the formation of a western counties branch, comprising the practitioners of Yarmouth and Shelbourne counties and Clare municipality. This was accomplished at a meeting held at Yarmouth on the third of October, when Doctors W. N. Rebfuss and S. L. Walker, respectively, the president and associate secretary of the Medical Society of Nova Scotia, accompanied by Doctors H. A. Chisholm and Joseph Hayes, of Halifax, met in conference with a fine representation of the physicians of the district mentioned. The first regular meeting of the new branch is to be held on the fifteenth of November. The officers are: President, Dr. A. R. Campbell, Yarmouth; Vice-Presidents, Dr. A. R. Melanson, Eel Brook; Dr. H. J. Pothier, Weymouth; Dr. F. H. Alexander, Lockeport; Secretary-Treasurer, Dr. T. A. Lebbetter, Yarmouth; Executive, the officers and Doctors W. C. O'Brien, Wedgeport, and A. J. Fuller, Yarmouth.

W. H. H.

QUEBEC

Dr. A. T. Bazin, D.S.O., M.D., professor of Surgery and Clinical Surgery succeeds Dr. H. M. Little as president of the McGill Graduates' Society of Montreal for a period of two years. Dr. Bazin graduated from McGill University in Medicine in 1894.

Dr. P. Maxwell, Professor of Gynaecology and Obstetrics in the University of Pekin, China, is at present on furlough and is visiting Montreal.

Plans are being completed for a campaign to raise $150,000 for St. Mary's Hospital between November 3rd and 17th. For some months, since the opening of the new hospital at 905 Dorchester Street West, quiet but effective work has been carried on to secure members for the St. Mary's Hospital Association, membership entailing the payment of a nominal annual fee. The money so collected along with several very generous contributions, has provided for current expenses, but the directors have found it necessary to obtain more funds immediately to complete the equipment of the present hospital and to enlarge its sphere of usefulness. St. Mary's Hospital, while under English-speaking Catholic direction is open to patients without regard to race or creed, and is at the service of all doctors of recognized standing. Although started only this spring, it has nearly fifty beds and as quickly as possible this number is being enlarged to meet the ever-increasing demands for hospital service. Authorities estimate that Montreal is some thousand beds short in hospital accommodation, and St. Mary's hopes in some small measure to relieve this situation.

In the presence of distinguished pathologists and representatives of universities from many parts of the world, including New Zealand, the new Pathological Institute of McGill University was declared open on October 6th (Founder's Day) by the Lieut.-Governor of the Province, the Hon. N. Perodeau. His Honour, himself a graduate of McGill, fifty years ago, was presented with a gold key which it was stated will unlock any door in the Institute. Sir Arthur Currie, Principal of the University, said they were gathered together to open the latest addition to the Medical School of McGill of which they were all so proud. It was interesting to recall the position from which the Medical School had arisen to prominence. The first degree given by the University was a medical one. In fact, it was doubtful if the provisions of the will of James McGill, the man they commemorated that day, could have been carried out had there not been a medical school in Montreal which associated itself with the newly formed University and became its most prominent department. With the facilities provided by the Montreal General and Royal Victoria Hospitals, the Anatomical Laboratory, the Biological Laboratory and the Pathological Institute he said they could not but look forward to great progress in the McGill Faculty of Medicine. Telegrams regretting inability to be present and wishing success to the Institute from the Chancellor of the University, E. W. Beatty, Esq., the Prime Minister, and others were read by the Principal. The Lieut.-Governor said: "It gives me great pleasure to be with you on this occasion, not only in an official capacity, but as one of the oldest graduates in law of this world-known university. I have watched with great interest and pride the steady growth of McGill. In the old days the arts building and the old Molson Hall constituted McGill. Now in addition to the many magnificent buildings, I am glad to witness the erection of this Pathological Institute, of which so much good is anticipated, and which as Lieutenant Governor of the Province I have now the honour and privilege to declare open."

The chief address of the day was delivered by A. E. Boycott, F.R.S., Graham Professor of Pathology in the University of London. He paid a warm tribute to the "ample and beneficient internationalism of the Rockefeller Foundation" for the new institute owed its being in part to the encouragement and stimulation of the Foundation as well as to the generosity and loyalty of the Alumni of the University, of the citizens of Montreal and of the Royal Victoria Hospital. Dr. Boycott said that at the present time the performance of some tests, such as the Wassermann reaction, which should be done in the clinical laboratories occupied the time of pathologists. In his opinion the pathologist should not merely attempt to solve problems, the answer to which would prove of immediate benefit to clinical medicine and surgery, but that time and opportunity should be provided for workers in the Institute to investigate

such a phenomenon as that named after the young French Canadian, d'Herelle. If this were properly understood our knowledge of life itself would be amplified, and, probably, further advances in the study of disease and disease processes would be brought about. Bacteriology is a wider science than is covered by the study of the microorganisms that invade the human body; plant bacteria must be studied also. A knowledge of comparative pathology would, if fundamental enough, help greatly in unravelling some of the mysteries of disease in the human. In Dr. Boycott's view, pathology had proved itself able to stand alone as a science and he welcomed the opportunity afforded at some universities in England to non-medical students seeking a degree of Doctor of Science or Doctor of Philosophy of taking pathology as one of their subjects. G. H.

ONTARIO

The Harvey Club of London, on a neatly printed post card with a picture of Harvey thereon, issued invitations for October the 3rd to an address on the subject of pneumonia by Harvey Hughes. Frequent references to the bulletin of this Harvey Club have appeared from time to time in this *Journal*, and we have acknowledged on many occasions our indebtedness to this excellent society.

Dr. H. A. Beatty has been appointed senior surgeon in the Toronto Western Hospital, and associate professor of surgery in the medical faculty of the University of Toronto. These appointments will give general satisfaction to the Western Hospital and to those of the outside who are interested in the progress of this institute. Dr. Beatty as a graduate of the University of Toronto, spent several years in postgraduate work in Edinburgh and Vienna, and after that became house surgeon to the Westminster Hospital in London; returning to Toronto he became connected with the Canadian Pacific Railway, reaching in 1915 the high office of chief surgeon and medical officer for all lines of the company. With many interests apart from those of medicine, and an active concern for the advancement of teaching, Dr. Beatty's appointment is sure to be approved of by all who think along academic lines.

The first annual convention of the Ontario Hospital Association took place at the Academy of Medicine in Toronto on October the 1st, and was exceptionally well attended by more than 125 nurses, doctors and hospital officials. Between eighty and ninety of Ontario hospitals were represented. Many problems of hospital administration were discussed. It was urged that a central purchasing bureau for hospital supplies be established The question of the ten hour day duty for private nurses was introduced by Dr. H. A. Bruce in a paper read for him in his absence. Dr. J. J. Walters of Kitchener suggested that the municipalities should pay the building expenses of hospitals as part of the general endeavour to avoid hospital deficits. Dr. F. W. Routley in his paper stated that the hospital costs for private and semi-private ward patients were ridiculously high; he also expressed dissatisfaction at the position taken by the Workmen's Compensation Board in refusing to pay extra charges for the use of operating rooms, etc. A resolution is to be drafted and sent to the Provincial Secretary requesting that this injustice be remedied. Other papers on various subjects were read and discussed. Dr. William N. Gartshore, of London, presided at the afternoon session, and Dr. Wm. Dobbie, of Toronto, at the morning session.

The Peel County Medical Society held a series of meetings during the months of August and September, at which the following subjects were discussed:—

Aug. 6th.—"Early diagnosis of tuberculosis," Dr. G. C. Brink, Provincial Board of Health; "The treatment of insomnia," Dr. R. D. Rudolf; "Diagnosis and treatment of the pneumonias of childhood," Dr. E. Morgan.

Aug. 13th—"Rural engineering problems from a public health aspect," Mr. A. E. Barry, Provincial Board of Health; "The range of the general practitioner in psychiatric diagnosis," Dr. G. A. McLarty.

Aug. 20th.—"The examination of a neurological case," Dr. R. G. Armour; "The treatment of venereal disease," Dr. J. W. Hunt; "Ontario Medical Association and county society work," Dr. Robert T. Noble.

Aug. 27th.—"Differential diagnosis of chest diseases," Dr. H. I. Kinsey; "The diagnosis and medical treatment of gastro-intestinal diseases," Dr. E. E. Cleaver.

Sept.—"The non-surgical treatment of enlarged prostate," Dr. E. E. King; "The modern treatment of nephritis," Dr. H. S. Hutchison. Dr. J. W. S. McCullough, Chief Officer of Health; Dr. D. McClenahan, District Officer of Health, and others addressed a public meeting in the town hall at Brampton. "Diseases of the rectum," Dr. Andrew Moorhead; "Goitre and other subjects," Hon. Dr. Forbes Godfrey, Minister of Health and Labour; "The physiology and pathology of digestion in infants and its relationship to practical infant feeding," Dr. Alan Brown.

The opening meeting of the Academy of Medicine took place in the Academy building on Tuesday, October the 7th, and took the usual form of a dinner in Osler Hall with the delivery of the presidential address. In his address Dr. Harley Smith touched on many points pertaining to the progress of medicine and the relations of the Academy to the profession at large. The election of the representatives of the Academy on the committee of general purposes of the Ontario Medical Association completed this evening.

The papers read at the meeting of the Canadian Tuberculosis Association at Ottawa on April the 8th, 9th and 10th, have been put together for distribution in a pamphlet labelled "Papers on tuberculosis." It forms an excellent collections of articles on the white plague; it can be procured from the Canadian Tuberculosis Association and will give the reader an excellent idea of what is being accomplished throughout the Dominion in the long continued fight against tuberculosis. It is interesting to realize that one after the other of the provinces have come to recognize that they must help in this campaign, and the various provincial activities are well detailed. Papers of a more technical nature are contributed by well known workers, and an unusually happy introduction by His Excellency the Governor General of Canada adds to the interest of the booklet.

At a meeting of the Victoria County Medical Society on August 1st, Dr. V. E. Henderson gave a talk on "The modern conception of the use of drugs."

On August 6th, Dr. J. W. Crane, of London, addressed a meeting of District Number 9 at North Bay, on the subject, "The Treatment of Bronchitis."

At a meeting of the Hastings County Medical

Society at Marmora on August 13th, Dr. Geo. E. Wilson gave an address on "Fractures."

The Sudbury Medical Society met on August 20th; Dr. A. J. Grant, of London, gave an address on "Office treatment of haemorrhoids and kindred conditions under local anaesthesia."

The York County Medical Society met at Newmarket on August 28th. Dr. Geo. E. Wilson gave a talk on "Fractures."

Dr. J. A. Macgregor, on London, addressed the Wellington County Medical Society at Fergus on Sept. 3rd, his subject being, "Some side lights on so-called indigestion."

At a meeting of the Sudbury Medical Society on September 10th, Dr. E. S. Ryerson gave an address on "The pathology of the gall bladder and bile ducts, and its relation to the clinical manifestations of disease, and the surgical treatment indicated."

On September 5th, Dr. E. E. Cleaver, addressed the Victoria County Medical Society at Lindsay, on the subject, "The interpretation of the signs and symptoms of chronic gastro-intestinal disease."

On September 17th, Dr. Gordon Bates gave a talk on venereal disease to the members of the Niagara Falls Medical Society. A moving picture illustrating this subject was also shown by the Provincial Board of Health.

Dr. N. A. Powell addressed the Lincoln County Medical Society at St. Catharines on September 23rd, his subject being "Medical jurisprudence."

The Sudbury Medical Society received an address on Sept. 24th from Dr. H. E. Schaef, of London, on "The uses of x-ray in medical and surgical practice."

N. B. G.

MANITOBA

The annual meeting of the Council of the College of Physicians and Surgeons of Manitoba was held in Winnipeg on Oct. 1st, 1924. There were twenty members present. Dr. A. E. McGavin, of Carman, was the retiring president. The following officers were elected: Dr. D. H. McCalman, President; Dr. J. S. Poole, Vice-President; Dr. J. E. Coulter, Winnipeg, Registrar, re-elected; Dr. W. G. Campbell, Winnipeg, Treasurer, re-elected; Dr. R. J. Campbell, Winnipeg, Representative on the University Council; Drs. R. S. Thornton and W. Rogers, Winnipeg, re-elected members of the Medical Council of Canada.

The Council appointed the following members as representatives on the Executive Committee of the Manitoba Medical Assn:—Drs. D. H. McCalman, J. R. Davidson, J. E. Coulter.

Dr. D. H. McCalman was appointed to represent the Council at the forthcoming Conference of Medical Services in Canada, to be held in Ottawa in December.

Fee-splitting. The registrar reported that he had obtained a legal opinion as to whether this practise came within the provisions of the Secret Commissions Act. Counsel advised that there was considerable doubt in the matter, which could be cleared up only by litigation.

Reports of standing and special committees were adopted. The registrar reported that seventeen new licenses had been issued during the year. The number on the register practising in the province was 505, 305 in Winnipeg and 200 in the rural districts. There was great improvement in the payment of fees, due to the Council having increased powers to enforce collections. Few old accounts are now outstanding.

By-laws. A number of alterations were made in the By-laws, the most important related to registration:

No 45.—Registration By-law

All applicants desirous of being placed on the register must pay the registration fee of $100 and produce to the registrar:

1.—A diploma of Graduation in Medicine from the University of Manitoba, or,

2.—A certificate of registration on the Canada Medical Register (L.M.C.C.) or,

3.—A certificate of registration on the register of the General Medical Council of the United Kingdom, provided that any applicant from any province of Canada be not accepted unless his British Registration has been secured by examination.

In addition, each applicant must produce evidence, satisfactory to the Council of his identity, good character and professional conduct, and,

That the certificate which he presents is in good standing.

An applicant from any university outside of Canada who desires an enabling certificate for the purpose of taking the L.M.C.C. examination must send to the registrar in addition to his degree or diploma detailed information as follows:—

First.—As to his matriculation; giving the name and address of the institution in which he was examined, the subjects, and the extent of each required.

Second.—As to medical course; the number and length of sessions, subjects taught, number of courses in each, and number of lectures in each course, amount, of clinical instruction in the different courses.

On receipt of this information the registrar will decide as to the eligibility of the applicant to write for license.

With reference to reciprocity in Registration with the Medical Council of the United Kingdom, a discussion took place. It was agreed that the position in this matter was not clear as to whether the General Medical Council required all applicants from Manitoba to have had a five year course. If so this provision would exclude most of the doctors now practising in the province. The registrar was instructed to call the attention of the registrar of the General Medical Council to the resolution passed in this regard a year ago, and to ask for specific recognition of the proviso in that resolution, in which it was suggested that the clause relating to the five year course should only affect graduates obtaining their degrees after the date of the coming into force of the new resolution.

Gordon Bell Memorial

A sum of $20,000 was set aside to be invested, and the income therefrom used as an annual award for research work in some branch of medicine. In the first place it was agreed that the work should be of a kind dealing with some of the known activities of the late Dr. Gordon Bell. Applicants may be undergraduates, graduates, registered practitioners or those engaged in teaching medicine in Manitoba. A committee was appointed to prepare details of a scheme for the awarding of the Memorial, and submit the same to the next meeting of the Council.

A joint meeting of the Executives of the Winnipeg Medical Society and the Manitoba Medical Association was held on October 2nd, 1924, to advise the medical

staff of the Children's Hospital, Winnipeg, as to the attitude of the profession towards a proposal of the Shriners to establish a Mobile Orthopaedic Unit at the Children's Hospital. It was stated that the committee acting on behalf of the Shriners had dealt with the Hospital Board, and had not consulted the medical profession, with the exception that a member of the committee had mentioned the matter to his family physician.

A resolution was passed to the effect that no organization should expect the free services of members of the medical profession without consulting them beforehand. The meeting considered it unfair that medical men should be placed in the position of appearing to grudge free treatment to charity cases. Other objections to the method of establishing the clinic were mentioned; the meeting decided not to approve of the proposal to establish a second orthopaedic service in the hospital in question until such time as the objections mentioned were met. The staff of the Children's Hospital adopted the resolutions and handed the same to the Hospital Board. R. M.

ALBERTA

The members of the Gyro Club of Calgary, recently established and generously agreed to maintain, a diagnostic clinic for infants and for children of pre-school age. This clinic is being conducted by members of the Calgary Medical Society, assisted by the Victorian Order Nurses, and is open twice a week. Although in operation for a short period its value and usefulness have been demonstrated. On alternate days to the clinic the nurses of the Victorian Order conduct a weighing station for babies.

The regular monthly meeting of the Academy of Medicine held at the University of Alberta, Edmonton, on September 29th, 1924, was well attended.

An interesting report on "Personal impressions gained by a visit to Potter's Clinic" was given by Dr. L. C. Conn.

Dr. Emerson Smith gave a paper on "Some results obtained from the use of Mercurochrome."

A case of tetanus in a child of nine years of age due to injury from a nail in the foot, was reported by Dr. D. B. Leitch, where the administration of 60,000 units of anti-tetanus serum, was followed by quick recovery.

Some very interesting pathological specimens from the Pathological Department of the University were exhibited and described by Dr. Vango of the Pathological Department.

Dr. W. E. Spankie has returned to Calgary and will specialize in diseases of the eye, ear, throat and nose, having spent the past eighteen months in London, Paris and Vienna pursuing special studies in these subjects.

Dr. C. E. Coleman, of Calgary, left recently for New York, where he intends taking up special post-graduate work. G. E. L.

BRITISH COLUMBIA

Dr. Walter Bapty has been appointed to the executive of the British Columbia Medical Association as representative of the Victoria Medical Society.

Dr. W. Laishley, of Giscome, and Dr. J. W. Lang, of Hutton, have recently been appointed medical officers of health for their respective districts.

Dr. A. W. Hunter, Pathologist at the Vancouver General Hospital, has left on a hunting trip in the Nicola Valley.

An interesting ceremony took place in Vancouver on the 6th of September, when Dr. Jas. W. Lang, of Hutton, B.C. was married to Miss Florence Lott, R.N, of Pictou, N.S. Dr. Lang is a McGill graduate, 1923.

Dr. Oliver S. Large, accompanied by Mrs. Large, left last month on the S.S. *Empress of Canada* for a trip to Japan and China and are expected back in the city early in November.

Dr. R. E. Coleman, of the Vancouver General Hospital Laboratories, who recently went east to study methods in the treatment of diabetes in the Toronto General Hospital, was recalled to the city owing to the tragically sudden death of Dr. R. H. Mullin.

Following the Annual Meeting of the British Columbia Medical Association in July, the standing committees for the year were appointed by the executive. The Chairmen are as follows:—Industrial Service, Dr. A. B. Schinbein; Legislative, Dr. M. J. Keys; Publicity and Educational, Dr. Wallace Wilson; Constitution and Credentials, Dr. A. W. Bagnall; Ethics and Discipline, Dr. J. A. Gillespie.

Dr. D. P. Hanington, of Kimberley, B.C., who is enjoying a six weeks' vacation, will return on November 1st. His practice is in charge of Dr. Wm. Rose, who has had considerable experience in locum tenens work, throughout the province.

Dr. G. A. Lamont has returned to Vancouver after some months spent visiting the important pediatric clinics in eastern cities. Dr. Lamont will give an address before the Association in December, when he will take as his subject "The Early Weaned Baby.'

An Executive Meeting of the British Columbia Medical Association was held on Friday, Oct. 3rd, when several matters of importance were dealt with. Dr. C. H. Vrooman, President, presided. After the business was finished the Chairman outlined his views for the establishment of a Benevolent Fund in connection with the Association, and a committee was appointed to go into the matter and bring in a report at the next meeting.

The first issue of the *Vancouver Medical Association Bulletin* appeared on October 1st, and was distributed to all the medical men in the province. The first issue, in addition to the complete programme for the year, contained a lengthy abstract of an address by Dr. C. H. Vrooman on "Points in the Diagnosis of Disease in the Lungs," which he recently delivered at Prince Rupert. Although the first issue is necessarily somewhat small,

it is hoped as time goes on to increase both its size and scope to make it of real value and interest to all the medical men in the province.

The opening meeting of the winter session was held in the University of British Columbia on October 7th, when about fifty members were present. The president, Dr. H. H. Milburn, outlined the programme for the session, drawing special attention to the proposed visit of Dr. R. C. Coffey, of Portland, who proposed to give clinics and an address on "The Quarantine Pack in Abdominal Surgery" on October 28th. At the close of the business session, Dr. H. H. Milburn delivered the Presidential address, taking as his subject "Thomas Sydenham, the Practical Physician." His paper was much enjoyed by those present, and in future it is proposed to devote at least one evening each session to papers and a discussion on interesting persons or facts in the history of medicine.

The semi-annual meeting of No. 4 District Medical Society (Okanagan), was held at Tranquille Sanatorium on Sept. 16th, when addresses were given by Dr. J. H. MacDermot on "Medical Organization"; Dr. C. H. Vrooman on "The Diagnosis of Some Lung Conditions"; Dr. J. S. Burris on "Lung Abscess," and Mr. C. J. Fletcher, Executive-Secretary, on "The Activities of the British Columbia Medical Association." Dr. A. D. Lapp, Superintendent of the Sanatorium, presented a number of x-ray plates illustrating various diseased conditions in the lungs. A resolution was passed that the Society acknowledges to the Provincial Government, through the Honourable Dr. J. D. MacLean, its keen appreciation of the valuable work on tuberculosis being accomplished by Dr. A. S. Lamb throughout the province. Dr. Lamb explained his methods and expressed his appreciation of the resolution. The Chair was taken by Dr. J. S. Burris, of Kamloops. The following officers were elected for the ensuing year:—President, Dr. J. J. Gillis, Merritt, B.C.; Vice-President, Dr. J. H. Hamilton, Revelstoke; Sec.-Treasurer, Dr. Lee Smith, Princeton; Representative on Executive of B. C. Medical Association; Dr. J. E. Affleck, Pentieton, B.C.

The first luncheon of the winter session of the Medical Association was held at the Ambassador Cafe, Vancouver, on the 3rd October, with an attendance of 103 medical men. An inspiring address was given by the Honourable A. M. Manson, Attorney-General of British Columbia, on "Citizenship." Several members of the provincial parliament were present. A vote of thanks was afterwards presented to the speaker in a delightful and witty speech, by Dr. H. H. Murphy of Kamloops, President-Elect of the B. C. Medical Association. It is intended to continue these monthly luncheons throughout the winter months, and it is hoped that all out of town members who can possibly attend will make an effort to do so. They have proved a great success, and some very valuable addresses have been heard at them.

J. F. C.

A Physician on the Use of Alcohol.—In the debate on the liquor (popular control) bill in the House of Lords, Lord Dawson (physician to the London Hospital) said that the consumption of alcohol in this country was far too great and that the nation spent too much on it. But in searching for a cure they should be watchful and see that they did not replace one evil by another. He deprecated the constant quotation of America, and thought that we should find our own remedies for our own ills. This country was becoming temperate, and at an accelerated rate. If the conditions responsible for the improvement were fostered, they could face the solution of this dire problem with greater ease than in the past. The opinion of the medical world, both in this country and abroad, was by a very large majority in favour of alcohol as a useful substance, a beneficent agent when taken in proper quantities, at proper times and by people whom it suited. The majority of the profession drank wine, though in strict moderation. It was perfectly true that the action of alcohol was in no way useful to those occupied in physical or mental labour. It was further admitted that, though it was a food, it was an unsuitable and wasteful food for those in ill health. But its action on the nervous system was beneficent and useful when taken in proper quantities at the proper time. A glass of alcoholic liquor at the end of the day would lighten the mental horizon, brighten the outlook, and enable a man to drop those gray coloured spectacles with which he viewed the world after the hardships of the day, and give him content of mind and happiness. They ought to do nothing that would diminish the cheerfulness and the measure of sociability so helpful in helping us along our mortal road. Lord Dawson then gave figures illustrating the decline of the abuse of alcohol, taking first delirium tremens. In one large hospital for the three decades between 1894 and 1923, the number of cases began at 27.8 a year, and went down to 17.6 in 1904-1913, and finally to 10. For the same decades the figures for cirrhosis of the liver were 61.4, 53.2 and 20; for alcoholic neuritis, 23.8, 14.1 and 5. During the same period, the consumption of beer per head of the population was in the first decade 29.52 gallons, in the second 28.9, in the third 26.6, and in the last year only 15.8. Similarly, the consumption of spirits had fallen from 0.87 gallon per head of population to 0.31. He would leave restrictive measures alone and proceed on the line that if the people were given better houses and more recreation grounds, they would themselves do the rest.

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Investments

Within recent years Life Insurance Companies have made a strong appeal to their policy holders to undergo a medical examination at least once a year. The medical profession no doubt are largely responsible for such a move—the idea being to detect and counteract any disorders that may appear before they have time to cause serious trouble. For the same reason the periodical examination of a saving fund is even more important, for, while it is easier to keep a healthy man well than it is to make a sick healthy, somewhat the reverse applies to saving funds. Failure to realize that it is easier to make money than to keep it has been the cause of many financial losses. A financial loss is never pleasant to the loser—but how much more unpleasant it is to his dependents.

The habit of taking a night off every few months to spend in a study of investments is one that will be amply repaid. Business conditions are never stationary—they constantly change—and business conditions affect the value of securities—therefore it behooves the investor who desires to make the most of his savings fund to keep in close touch with changing conditions. A concrete illustration of what can happen is found in the present day value of the highest grade bonds we have in Canada—those of the Dominion Government, which are selling to-day at prices representing an increase in value of the original issue value of approximately $90,000,000. Such bonds fluctuate less than probably any other securities, yet, even they are affected by changing conditions. Investors who watch conditions are in a position to take advantage of good conditions and discount the bad.

The experienced successful investor understands these facts and knows how to analyse his investment fund, but for the benefit of the inexperienced the following are a few main questions which each investor should ask himself:—

1.—Is the principal and interest of my investment individually safe?

2.—Is my investment account top heavy, or is it properly diversified?

3.—Could a rearrangement or a balancing of my investment fund provide greater safety, increase my income or decrease my income tax?

4.—Is the income earned as large as I can secure with safety?

5.—Am I losing income by holding too many tax exempt bonds?

6.—Is the character of my investments in keeping with my own character and habits—are they actually the ones I should have?

7.—Are the coupons payable at the time of the year most suitable to me?

8.—Do I now own any bonds selling at a premium which I can sell at a profit and reinvest the proceeds without loss of income?

9.—Do I own any bonds that will mature shortly? Should I sell them and reinvest now, or hold them until maturity?

10.—Is the money I have invested accomplishing any good purpose? Is it employed to the best purpose?

11.—Are my bonds kept free from danger of fire or theft?

There is one other question to be asked; that is, "Am I fully qualified to answer these questions myself, or could I benefit by the advice of an investment banker?"

In a previous article we mentioned the result of a loss of income through inability to make the highest return consistent with safety. Such a loss is in every way as important as a loss of principal.

If you will study out your own problems first, then before acting, have your decision confirmed by an investment banker of experience, you will not only learn much of the science of investing, but you will benefit financially by avoidance of losses, either of principal or interest.

NOTE.—As this page has now been running for the past few months, the General Secretary will be glad to receive an expression of opinion from the members as to the advisability of continuing it. Please address all communications on this matter to the General Secretary at 184 College Street, Toronto.

Members are invited to write to the General-Secretary, Dr. T. C. Routley, 184 College St., Toronto, for information or advice regarding investments.

Inquiries will be entirely confidential, and answers will be based upon information believed to be reliable, fair and unprejudiced.

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Book Reviews

The 1923 Collected Papers of the Mayo Clinic, Rochester, Minn. Octavo of 1,377 pages with 410 illustrations. Cloth $13.00 net. Philadelphia and London; W. B. Saunders Company, 1924. Canadian Agents, The J. F. Hartz Co., Limited, Toronto and Montreal.

When it is realized that this volume comprises two hundred and ten individual articles, with reference by title only to as many more, written by one hundred and forty-eight authors, all connected either with the Mayo Clinic or the Mayo Foundation, it will be quite readily understood that any real review is quite impossible within the space limits at our disposal.

Suffice it to say then, that fifty-three articles refer to the alimentary tract, thirty-two to the urogenital organs, twenty-one to the ductless glands, twenty-four to the blood and circulatory organs, while the remainder are apportioned to skin and syphilis, head, trunk and extremities, brain, spinal cord and nerves, technique, and general miscellaneous.

The variety of the individual topics discussed is equally broad, ranging as it does from "Psychic Manifestations in Migraine" through various experimental problems in blood chemistry to "Technic for the Resection of Gastric and Duodenal Ulcer."

The character of the papers is beyond reproach, the subject matter is always presented in a clear and concise manner; in short the volume is in these respects fully up to the high standard established in previous years. Yet in the last one or two years a change has been noticeable, which is most marked in the volume under discussion. One has always felt that these volumes were essentially surgical, including of course, diagnosis and the methods that lead thereto, as well as operative technique. In the present book, however, perhaps more than half the papers refer to some more or less underlying problem, such for instance as "The effect of total removal of the liver in the lower vertebrates" or "Studies of capillaries and blood volume in Polycythemia Vera."

As matters of reference these may be of great value, and it may be that at some not far distant date these studies will develop something of extreme practical utility. But the problem arises, how can the busy practical surgeon read, mark, learn, and especially inwardly digest this mass of pioneer work.

Would not the purpose be better served if the mass of surgical experience, the methods of practical use in diagnosis, and the technical details of surgical procedure which have enabled the Mayo Clinic to report such enviable statistics, were presented in one volume, while the experimental work, the problems of blood chemistry, and the papers on purely medical topics such as "Specific Serum Treatment of Epidemic (Lethargic) Encephalitis" were issued in another.

All this is, of course, not intended as a criticism, but merely a suggestion. The volume is beyond criticism.

E. R. S.

International Clinics. Thirty-fourth series, volume ii, 1924. Edited by Henry W. Cattell, A.M., M.D. Philadelphia, U.S.A., with Medical and Surgical Collaborators in United States, England and Canada. Price $2.50 per volume or $10.00 for the series of four. J. B. Lippincott Company, Montreal, Quebec.

The departments appearing in this number are Physiotherapy, Diagnosis and Treatment, Neurology, Pediatrics, Surgery, Pathology and Industrial Medicine. With the articles on physiotherapy are included papers on x-ray and radium. Gordon Heyd discusses the diagnosis of right sided abdominal conditions and Louis Potheau of Paris, the treatment of syphilitic aortitis. Barker's clinic on Parkinsonian symptoms in encephalitis is highly interesting. Papers on jaundice as a symptom and on poliomyelitis are the important ones in pediatrics. Don. Balfour reviews the recent advances in anaesthesia and in surgery in an excellent article which precedes several valuable papers in surgery. Thomas Darlington is to be congratulated upon his contribution —a talk to the recent medical graduate upon health and hygiene in industry. He considers that half of the loss of time in industry from illness is preventable.

J. H. E.

Dislocations and Joint Fractures. (Second edition, reset). By Frederick J. Cotton, M.D., Visiting Surgeon to the Boston City Hospital; Associate in Surgery, Harvard Medical School. 745 pages with 1393 illustrations from drawings by the author. Cloth $10.00 net. Philadelphia and London: W. B. Saunders Company, 1924. Canadian Agents, The J. F. Hartz Co., Limited, Toronto and Montreal.

Inasmuch as this volume covers all fractures even indirectly connected with the joints, such, for instance, as fracture below the lesser trochanter of the femur, it may be said to be more a dissertation on fractures than on dislocations. Practically the only fractures not dealt with are those of the mid portion of the shaft of the long bones.

In general the author's views on the treatment of these various injuries are sound, and are definitely enunciated, since he does not hesitate to discard old and established methods when they do not appear to him to be based on a correct foundation.

With reference to the use of the x-ray he is definitely of the opinion that its greatest value is after, not before, reduction. For this opinion he advances several reasons, chief among which may be that "It is unlikely that more than one x-ray will be taken in a given routine case. This one may best be taken when it will check both diagnosis and corrected position."

Speaking of the operative treatment of fractures he says "That he is not one of those who believe in indiscriminately operating on simple fractures, but he believes that there is a large field of usefulness for those whose experience renders such operative work reasonably safe and certain; that there are a few cases that will do better as a rule if operated on early, while other cases call for operation only if the reposition ordinarily practicable fails for some special purpose.

The author's drawings are excellent, but the reproduction of many of the x-ray plates leaves much to be desired. Some fault may also be found with the diction; we regret the tendency to use abbreviated sentences, such as are met with in bedside notes. However, the meaning is usually quite clear. The entire work is a distinct credit to the author, and should be of very difinite value to all who come in contact with this class of cases.

E. R. S.

Operative Surgery. By Warren Stone Bickham, M.D., F.A.C.S., in six octave volumes. Volume iv, containing 842 pages with 772 illustrations. Cloth $10.00 per volume. Sold by subscription only. Philadelphia and London, W. B. Saunders Company. and Montreal.
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As has been indicated in the review of previous volumes this work seem destined to be the most comprehensive consideration of the subject which has been

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published for some time in America, or indeed in the English language.

The present volume, covering as it does operations on the pericardium, heart and other intra-thoracic organs, and practically the whole subject of abdominal surgery from stomach to caecum, will naturally be of special interest to the general surgeon whose daily work in a large degree occurs within the area indicated. Every operation in common use is fully described and beautifully illustrated, but as has been remarked before, the value of the volume might be increased if the author were to indicate in his comments which of the various methods described he has personally found of most value. For instance considerable space is allotted to pylorectomy by the Billroth I. method, and rather less to the Billroth II. method and but little indication is given as to their relative ease of performance, or to the indications for either, whereas it would appear that in practical work the Billroth II. would be the method of choice nine times out of ten.

In a work of this size which has necessarily taken a very long time to prepare, it must happen that some methods are included which have become more or less obsolete. Thus in cholecystostomy suture of the opened gall-bladder to the peritoneum, fascia or skin is nowadays very seldom done, yet the rubber tube drainage with the gall-bladder allowed to resume its normal position is referred to, as only applicable, in cases of difficulty in getting the gall-bladder up to the abdominal wall.

Several pages, and many illustrations are utilized to describe various methods of treatment of the base of the appendix, by purse-string suture or otherwise, while no mention is made of the method of simple ligation of the base, with careful destruction of the mucosa of the stump by the actual cautery—certainly the simplest, and in the hands of many operators, the most satisfactory method.

The author is certainly to be congratulated on the results of his endeavours. The text is readable and free from clerical errors, and if the remaining two volumes maintain the high standard of the four already published one has no hesitancy in predicting that the entire work will become the standard exposition of the subject for some time to come. E. R. S.

The Science and Art of Anaesthesia. By Colonel William Webster, D.S.O., M.D., C.M. Professor of Anaesthesiology, University of Manitoba Medical School. Med. 8vo, pp. 14, 37 illustrations. Price Price $4.75. St. Louis, The C. V. Mosby Company, 1924.

This manual is offered to the medical student and to the physician in general practice, who perhaps gives only an occasional anaesthetic. General, local and spinal anaesthesia are considered. Following an introduction upon history, there is a well written discussion of the physiology of anaesthesia. The several anaesthetics in general use are considered in turn, both individually and in mixture. Chapters follow on the choice of anaesthetics, heating of the gases, preoperative preparation and postoperative treatment of the patient, surgical shock, acidosis, the art of inducing anaesthesia, and the patient's viewpoint; chapters on statistics, records and the medico-legal aspect. The work covers in a concise manner all the important details of the subject as outlined, and will be found a safe and excellent guide to the practitioner. The book is also well made and is in every way a credit to Canadian authorship. J. H. E.

An Index to General Practice. By A. Campbell Stark, M.B., B.S. (Lond.). Small 8vo, 181 pages. Price $1.75. London, Baillière, Tindall and Cox, 1923.

A little handbook of practice written by a general practitioner of many years' experience for the man in general practice, especially the young man. The outcome of a considerable number of trials and errors. He deplores the fact that experience in general practice is not a necessary qualification for election to a hospital staff or a teaching post. It is full of helpful suggestions to the young practitioner. J. H. E.

The Normal Child, Its Care and Feeding. By Alan Brown, M.B., Physician-in-Chief, Hospital for Sick Children, Toronto. 12mo. xiii + 254 pages, 14 illustrations. Price $1.50. Toronto, Frederick & Goodchild (1923).

There has been a need in Canada for a trustworthy volume on the care and feeding of children, especially the infant, which can safely be placed in the hands of a Canadian mother. We welcome this work by a Canadian who writes from a large experience and who has not hesitated to make use of the best of the writings of other authors, which debts are duly acknowledged. The rapidly lowering death rate in infancy in Canada has been due in large measure to the education of the mothers of the land in infant care; and in those centres where the greatest effort has been made by health departments and members of the medical profession the results have been most striking. A work such as this if it can be placed in the hands of every mother and its teachings put into practice, will be a further aid in lessening illness and promoting health. The subject matter is divided into twenty-four chapters, and include the hygiene of the nursery, clothing, bathing, care of teeth, exercise, sleep, airing, growth of the infant, feeding in health and illness, weaning, stools, discipline, education and habits, with some reference to the common diseases of childhood. J. H. E.

Diabetes. Its Treatment by Insulin and Diet. A handbook for the patient by Orlando H. Petty, B.S., A.M., M.D., F.A.C.P. Professor of Diseases of Metabolism, Graduate School of Medicine, University of Pennsylvania With several illustrations. Price $1.50 net. Philadelphia, The F. A. Davis Company, publishers, 1924.

A small handbook for the diabetic patient outlining in detail the calculation of the daily diet. In the hands of the patient it will aid the physician in controlling the diet and in assuring comfortable meals. Chapters are included on testing urine for sugar and on administration of insulin at home after a course of treatment under the physician's guidance. The sample menus and recipes offer helpful suggestions. The food tables include most of the foods in general use. There is a fine tribute to Banting in the chapter on insulin. The book in our opinion, however, is not quite complete, for it lacks instruction in hygiene and fails to direct the patient or his family to be on the watch for those signs and symptoms which suggest the onset of serious complications such as coma.

A Diabetic Manual for the Mutual Use of Doctor and Patient. By Elliott P. Joslin, M.D., Clinical Professor of Medicine, Harvard Medical School. 3rd edition, thoroughly revised (viii) 211 pages, 18 illustrations. Price $2.00. Lea & Febiger, Philadelphia and New York.

This should prove a most useful handbook for both physician and patient. Diabetes is defined, insulin explained and the calculations of diabetic arithmetic demonstrated; a valuable chapter is that giving the patient instruction in the observations to be made when reporting to the physician. The hygienic instructions as to care of the teeth, skin, feet and digestive tract are excellent. The diabetic suggestions in recipes and menus and the food tables are of course given due consideration and form an important part of the work. Instructions are given for home examination of the urine and for home

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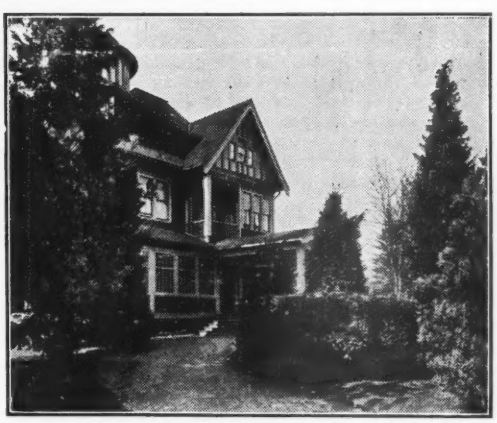

administration of the insulin. It is a most excellent manual for use in a disease where so much depends upon the co-operation of the patient with the physician.

J. H. E.

Mind and Medicine. By Thos. W. Salmon, M.D., Professor of Psychiatry in Columbia University. An address given at the opening session of the College of Physicians and Surgeons, Columbia University, September, 1923. 33 pages. Published by the Columbia University Press, New York, 1924.

This is an address that Dr. Salmon gave at the opening session of the College of Physicians. It is an excellent introductory talk that would be useful to any person having a similar object to fulfill, including as it does Dr. Salmon's own ideas of the true relationship between mind and medicine. G. W. H.

First Steps in Organizing a Hospital. By Joseph A. Weber, M.A., Editor, The Modern Hospital, 8vo, xii + 205 pages. Price $3.25. New York, The Macmillan Co., 1924.

Hospital Organization and Operation. By Frank E. Chapman, Director Mount Sinai Hospital, Cleveland. 8vo, xv, 270 pages, 58 illustrations. Price $4.20. New York, The Macmillan Co., 1924.

These are two volumes of a projected series of handbooks dealing with various phases of hospital organization, construction and management. The first volume begins with an introduction devoted to the hospital field of to-day and sketches the growth of hospitals during the past fifty years, their classification according to size, and the distribution of hospitals. In the first chapter the author points out the unfortunate situations which have arisen through building a hospital without an adequate study of the needs of the community and without proper planning. He outlines the type of survey which should be made before undertaking hospital plans, this is followed by the procedure desirable to interest the citizens of a community and secure their co-operation. The duties and responsibilities of the Board of Trustees in the preliminary organization of the hospital form an important chapter, concerned as it is with the architect, the contractor, the hospital consultant, the selection of the superintendent and medical staff, the nursing staff and other important duties. The financing of the construction is another chapter, as is the organization of permanent auxiliary boards. The appendices contain valuable examples of constitutions and by-laws, building agreements and bonds, with lists of employes and probable salaries in hospitals of 35, 50, 100 and 169 beds, also tables of earnings and expenditures.

The other volume deals with the internal activities of the hospital, founding the discussion upon the three primary functions of a hospital, (1) the care of the sick; (2) the teaching of students; (3) the study of disease. It is full of helpful suggestions based on actual practice, regarding administration, medical staff, diagnostic and therapeutic service, nursing, dietary, social service, purchase and issuance of stores, housekeeping, etc., with specimens of the forms and records desirable for the administrative and medical services.

There is a need for such handbooks and these should be of great service in their respective fields. J. H. E.

Mental Disorders. By Francis M. Barnes, Jr., M.A., M.D. Second edition. 295 pages, price $3.75. Published by the C. V. Mosby Company, St. Louis, U. S. A.

This book is arranged on the same principle as Bleuler's larger volume and is easily read and understood. It has a very excellent classification, a useful point for the introspective physician. Stress is also laid on endocrine disorders as cause of mental states. The psychoneuroses are relegated to a very small chapter, and in short the volume is one that is useful to the student but is rather too brief to be used as a reference book by the more experienced physician. G. W. H.

Textbook of Psychiatry. By Prof. Dr. Eugen Bleuler. Authorized English Edition by A. A. Brill, Ph.B., M.D. 624 pages. pages. Price $7.00 . Published by The MacMillan Company of Canada, Limited.

Bleuler's name is too well known to require introduction and Brill has succeeded in translating his master's text-book in a most admirable manner. The book is arranged somewhat differently to the regular works on psychiatry we are accustomed to study, and the general division occupies about the same amount of space as the individual disease section.

An excellent series of chapters on the psychic functions, is followed by a description of general psychopathology, taken up from every standpoint; the description of disturbances of association and of thought has been most fully studied. In the individual study, there is an exhaustive and at the same time interesting study of alcoholism that is worth the reader's attention.

Psychopathic forms of reaction is another title which includes paranoia, litigious insanity, reactive insanity, hysteria, and neurasthenia, the expectation neurosis, and so on where we recognize old friends under new names.

The book is well worth reading and using as a reference. At times there are such differences from the usual acceptation that one may feel opposed to the writer, but there is, on the other hand, such a wealth of knowledge, and it is so well thought out and expressed, that this translation must be placed as a book that every psychiatric library should possess.

G. W. H.

The Diagnosis of Nervous Diseases. By Sir James Purves-Stewart, K.C.M.G., C.B., M.D., F.R.C.P. Sixth edition, revised. 648 pages, illustrated. Price 30 shillings net. Published by Messrs. Edward Arnold & Co., London, England.

This new edition of Purves-Stewart's book is a great improvement on the last; it is fuller, and has been completely rewritten. One must remember that this is not a compilation of diseases, but a book on nervous diagnosis in which the symptoms of disorder in each part of the nervous system are carefully stated and separated one from the other.

As a textbook of nervous diagnosis, this book is without doubt the best in the English language. It is advisable that every student should use a copy for reference as he studies his nervous cases, so that he may increase the breadth of his knowledge and his diagnostic powers. G. W. H.

The Anatomy of the Nervous System. By Stephen W. Ranson, M.D., Ph.D., Professor of Anatomy in Northwestern University Medical School, Chicago. Second edition, revised. Octavo volume of 421 pages with 284 illustrations, some of them in colours. Published by W. B. Saunders Company, Philadelphia and London. Canadian Agents—The J. F. Hartz Co. Ltd., Toronto and Montreal.

The second edition of this book is even better than the first and includes excellent plates, and descriptions of the blood supply of the brain, with additional work on the basal ganglia that most important part of the brain in recent researches.

To review this book is practically impossible, but in our judgment it appears to be one of the best volumes on the anatomy of the nervous system, well suited to the student and to the advanced physician, and invaluable to the neurologist. G. W. H.